The Influence of Personality and Children's Facial Cues on Parenting Behaviours

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Abstract

Children's facial cues, such as cuteness, health, happiness, and resemblance to parent, influence caregiving perceptions and behaviours. This thesis investigated whether parents' personality traits increase/decrease sensitivity to these cues. Results showed that parents' scores on the HEXACO Honesty-Humility scale were negatively related to observed parent affection when judge's ratings of children's health were moderate and high, and parents' scores on the HEXACO Emotionality scale were negatively related to observed parent monitoring when judge's ratings of children's happiness were low and high. Further for Emotionality, scores of Emotionality: Attachment were negatively related to parent monitoring and support when ratings of children's happiness were high, and scores of Emotionality: Worry were positively related to parent support when ratings of children's health were high. These results suggest that parenting is related to both parents' and children's characteristics and certain combinations of parent personality and children's facial cues may be associated with neglectful parenting.

Keywords: Parenting, parent personality, parent investment, facial cues, evolution

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Introduction

The psychological study of parenting has been of interest to researchers since the early 19th century. Advances in the parenting field have included identifying parenting styles (Baumrind, 1967), children's attachment to parents (Ainsworth & Bowlby, 1991), costs and benefits of parenting (Trivers, 1972), and parents' influence on children's development (Bronfenbrenner, 1992). Studies have also demonstrated that various factors, such as culture (Harkness & Super, 2002), socio-economic status (SES) (Hoff, Laursen & Tardif, 2002), education level (McBride, 1990), and parental values (Luster, Rhoades & Haas, 1989), independently and collectively influence parenting. However, despite the multidisciplinary roots in parenting theories, many current studies take a strictly uni-disciplinary approach (Volk, 2011). A multiply determined construct, such as parenting, should be more broadly examined through an integration of various theoretical perspectives in order to provide a deeper understanding of parenting behaviours, parent-child interactions, and children's development (Bjorklund & Pellegrini, 2000).

More specifically, parenting studies that are investigated from developmental perspectives should aim to integrate evolutionary perspectives. The integration of these two theories is important because evolutionary theories describe current parenting behaviours as evolved psychological adaptations to the environment, which may indicate predicable individual differences in current parenting behaviours (Bjorklund & Pelligrini, 2000; Bowlby, 1980). In the same vein, evolutionary theories should aim to integrate developmental perspectives as there is evidence for natural selection to impact developmental stages from infancy to adulthood.

One of the areas within the parenting field that has been successful in using an approach that integrates developmental and evolutionary perspectives is children's facial cues (Debruine 2004; Volk & Quinsey, 2002). Researchers have found that cues of cuteness, health, happiness, and resemblance to parent have effects on caregiving behaviours that range from small to large, based on the type of facial cue. However, individual differences that may increase or decrease sensitivity to these facial cues are relatively unexplored as are actual observations of parental behaviors in relation to these cues. Therefore, the goal of this thesis is to explore the influence of children's facial cues and parents' personality on parenting behaviours in isolation and combination through an evolutionary and developmental perspective.

Parental Investment Theory

Trivers (1972) defines parental investment as any investment (e.g., guarding, feeding, and caring) in an offspring that will increase the offspring's chance of survival and consequently increases the parents' reproductive success. However, investing in an offspring comes with high costs for parents such as limited resources, mating opportunities, maintenance of one's health, and ability to invest in other offspring. Therefore, parents may have acquired adaptations to adjust their investment levels based on which offspring will maximize parents' genetic fitness.

Two such adaptations are theorised to be infant abandonment and infanticides. Infant abandonment by biological parents has been recorded throughout human history (e.g., Moses was abandoned by his mother in the bible; Boswell, 1988) as well as in present day humans (e.g., among the Alto in Brazil; Scheper- Hughes, 1985) and animals (e.g., Japanese macaques; Schino & Troisi 2005). Infant abandonment is usually linked

with lack of resources (Hrdy, 1979) and thus may be adaptive for the biological parent in such cases as the infant may be cared for by another individual, which can increase parents' genetic fitness while conserving their time, energy and (limited) resources that might have otherwise been used to care for the child (Hrdy, 1992). Similarly, infanticides are also theorised be adaptive when a) the females' reproductive value is high (e.g., she still has many years of fertility left), b) parents lack resources (Langer, 1974), and c) the offspring shows cues of low health (Granzberg, 1973). Infanticides by biological parents are found across various cultures. For example, in certain Amazonian and Papuan tribes, infanticides by parents are shown to range from 20-40 % (Hrdy, 1979). Further, in some cultures, such as among the Alto in Brazil, infanticide is seen as a standard response to children born with health deficiencies as these children and perceived to deplete the parents' resources if alive (Scheper-Hughes, 1985).

Another adaptation for parents may be investing more in slightly older offspring, as ancestral infants and young children had the highest mortality rates compared to other stages of childhood (Attard-Montalto & Saha, 1999; Volk & Atkinson, 2013). Thus, it may be more beneficial to invest in slightly older offspring as they may have passed this window of high mortality. This may be surprising because humans today, especially in first world countries, do not frequently witness of infant mortality or overly sick children. In addition, ancestral parents may have more likely terminated investment in younger offspring due to the overall lower investments put into younger offspring compared to older offspring (Daly & Wilson, 1984).

A third adaptation for parents may be evaluating offspring fitness through various facial cues, which for the purpose of this thesis, will be defined as the combination of facial features and dynamic expressions of the child in the context of different situations.

Children's Facial Cues

Due to the high evolutionary costs associated with parental investment, parents must invest in offspring that will survive so that the high parenting costs will be off-set by the benefit of maximizing parents' genetic fitness (Trivers, 1972). As such, children's facial cues, such as resemblance to parent, cuteness, happiness, and health, may provide important information for parents regarding genetic relationship to offspring and offspring's ability to survive.

***Facial resemblance*:** As previously mentioned, evolutionary theories suggest that one of the main benefits of investing in offspring is to maximize genetic fitness. For that reason, it is imperative for parents to invest into genetically related offspring. While women can always be certain that their offspring are genetically related to them, men face the risk of paternity uncertainty, in which they may be raising genetically unrelated offspring (Geary, 2006). In fact, in the general western population, rates of paternity uncertainty are estimated to be 1.9% (Anderson, 2006). Therefore, fathers may have developed heighted sensitivity to cues of genetic relatedness, such as facial resemblance to offspring. Indeed, facial resemblance is modestly correlated with actual genetic relatedness (Alvergne, Faurie, & Raymond, 2007; Daly & Wilson, 1998).

Although maternal behaviour may also be influenced by cues of facial resemblance to offspring due to general pro-social behaviours associated with having

similar genes (Hamilton, 1964), paternal behaviour is shown to be most strongly influenced by facial resemblance. For example, step-fathers, who have lower levels of paternity certainty compared to biological fathers, are shown to invest less financial resources in step-children compared to biological children (Daly & Wilson, 1988). In cases where step-fathers do show paternal investment in step-children, researchers suggest that this may be an effort to please and appear more attractive to their new mate rather than being intrinsically motivated to provide care for the step-children (Anderson, Kaplan & Lancaster. 1999). Studies have also found that cues of facial resemblance have a strong influence on men's hypothetical (Platek el al., 2003; 2004; Volk & Quinsey, 2002; 2007) and actual (Alvergne, Faurie & Raymond, 2009; 2010) caregiving decisions. Further, neurological evidence suggests that males have stronger brain activation in areas related to error detection (e.g., left anterior cingulate) when viewing children's faces (Platek, Keenan, & Mohamed, 2005), suggesting that men have a predisposition to assessing degree of facial resemblance when looking at children's faces in general. Therefore, cues of facial resemblance may help parents (especially fathers) to confirm that they are investing in genetically related offspring. However, other facial cues may also be influencing parent behaviours to ensure they are investing in offspring who will survive.

***Health*:** Parents who invest in an offspring that does not survive end up losing their investment. Therefore, cues of health, assessed through body weight and facial structure may indicate children's chances of survival and consequently influence degree of parental investment. Children born with extremely low body weight have been found to have difficulty gaining adequate weight later in life (Hack & Fanaroff, 1999; Sweet et

al., 2003), face developmental challenges, and have increased risk of infant mortality. In addition, children with above average body weight are associated with gallstones and hepatitis (Must, 1996). As such, studies have found that adults invest more in children with high cues of health, such as average body weight. For example, adults are shown to provide higher hypothetical adoption ratings for children with average body weight compared to high or low levels of body weight (Volk et al., 2005; 2007). In addition, caregivers are also shown to provide less care to children with extremely low birth weight and health problems (Elmer & Greg, 1967; Hunter, Kilstrom, Kraybill & Loda, 1978). In fact, Hunter et al. (1978) found that 3.9% of infants who were born prematurely experienced abuse and maltreatment due to the families' low social support, biologically impaired infants, and limited parent-child contact at birth (and possibly low parent-child attachment as a consequence).

Similarly, children's facial structures may also indicate degree of healthy development. For example, facial symmetry is theorized to simulate good genes (Thornhill & Gangestad, 1999) as it is indicative of longevity (Henderson & Angling, 2003), sperm quality (Baker, 1997), and resistance to parasites (Thornhill & Gangestad, 1999). In addition, conditions such as cleft lip and palate and Fetal Alcohol Syndrome (FAS), that are associated with abnormal facial features, are shown to be linked internalizing problems in children (Thamilselvan, Kumar, Murthy, Sharma, & Kumar, 2015) and maladaptive behaviours (Streissguth et al., 1991) in infants, respectively. Possibly for that reason children with cleft lip and cleft lip and palate received lower attractiveness ratings compared to children with no cleft (Coy, Speltz, & Jones, K, 2002). In addition, studies have found that morphed children's faces resembling FAS receive

lower hypothetical adoption ratings compared to children with normal facial features (Waller, Quinsey, & Volk, 2004). Moreover, children who have been abandoned are usually found have abnormal facial features (Yamamoto, Ariely, Chi, Langleben, & Elman, 2009) and cues of poor physical health (Hrdy, 1999; Tisza & Gumpertz, 1962; Scheper-Hughes, 1985).

***Happiness*:** As with cues of health and resemblance, children's level of expressed happiness is also shown to influence adults' caregiving behaviors. Children's smiles are theorized to influence adults into providing care and increasing parent-child attachment (Bowlby, 1980). This is probably because cues of unhappiness may be a proxy for children's low health as children who are physically or mentally ill are less likely to depict happiness (Davison & Neale, 1994). In support of this theory, studies have found that adults perceive happier children to be cuter (Hildebrandt, 1983; Power, Hildebrandt & Fitzgerald, 1982), healthier (Volk & Quinsey, 2002) and more adoptable during hypothetical adoption tasks (Volk & Quinsey, 2002), compared to neutral and crying faces.

***Cuteness*:** In comparison to the aforementioned facial cues, cues of cuteness have shown to have the strongest effect on adult and parent behaviours. Infantile facial features, including chubby cheeks, large eyes, and curved forehead, are theorised to be adaptive for children as they increase their levels of perceived cuteness and consequently attract more adult care (Lorenz, 1943). One explanation for this is that cuteness may be indicative of good health (Volk & Quinsey, 2002). Attractiveness is theorized to have evolved through sexual selection due to associations with genetic variation and stability (Stephan & Langlois, 1984). As a result, studies have found moderate to large

relationships between children's cuteness and adults' (perceptive and behavioral) investment in various lab studies (Hildebrandt & Fitzgerald, 1979; Volk & Quinsey, 2002; 2007). In addition, there is evidence that nurses (Corter et al., 1978) and teachers (Ritts, Patterson, & Tubbs 1992) ascribe more positive qualities to cuter children, such as better social skills and higher IQ. Furthermore, even parents are shown to provide more positive caregiving behaviors, such as kissing and playing with cuter offspring (Harrell 2005; Glocker et al 2009; Langlois et al., 2000). Finally, neurological studies have found that adults show stronger activations in brain areas associated with empathy and reward (e.g., orbitofrontal cortex and nucleus accumbens, respectively) when viewing cuter children compared less cute children (Luo et al., 2015).

Although there is much evidence which shows that children's facial cues influence parenting behaviours overall, there is a wide range of effect sizes for these relationships. For example, for facial resemblance, Prokop, Obertova & Fedor (2010) found small effects between facial resemblance and parental behaviour while Platek et al. (2003) found large effects. Similarly, for cuteness, Volk & Quinsey (2002) found moderate effects for children's cuteness and hypothetical adoption ratings while Chin, Wade and French (2006) found large effects. In addition, for health, Volk & Quinsey (2002) found small to moderate effects between children's perceived health and hypothetical adoption ratings while Volk & Quinsey (2006) found moderate to large effects. Finally, for happiness, Volk & Quinsey (2002) found small effects between children's perceived health and hypothetical adoption ratings while Aradhye, Vonk & Arida (2015) found moderate to large effects. One explanation could be that these studies differed in measurement (e.g., morphed vs. non-morphed images, laboratory vs.

perceptual data) and sample (parents vs. non-parents). However, while methodological factors may be driving the variations in effect size, another possibility is that a third variable moderates the relationship between facial cues and parenting behaviours. The previous studies did not account for personality traits that have also been previously associated with parenting behaviour (Belsky, 1984), making it a reasonable prediction that personality may moderate the facial cue-parenting relationship.

Parent Personality

Belsky (1984) theorised three determinants of parenting: parents' personality, children's characteristics, and environment. Out of these three factors, parents' personality was theorised to have the strongest influence on parenting behaviours as it directly influences parenting style (Kochanska et al., 1997), parents' interpretations of the environment (Belsky, 1984), and parent-child relationships (Brook, Whiteman, Balka & Cohen., 2001). Parents' personality traits have been associated with various aspects of parenting, such as parenting style (e.g., authoritative, authoritarian, permissive, and uninvolved), parents' responses to 'demographic risk' (e.g., low parental education, age, and family income), parents' coping mechanisms (Belsky, 1984), and parenting practices (Bornstein, Hahn, & Haynes, 2011).

Much of the research on parents' personality has used the Five Factor Model (FFM) to measure personality traits, which includes the following five personality traits. First, Extraversion is described as outgoingness and liveliness (Laney, 2002). Second, Agreeableness is described as a general need for social harmony (Losoya, Callor, Rowe & Goldsmit, 1997). Third, Conscientiousness is described as high levels of self-discipline and ambition. Fourth, Openness to Experience is described as a general appreciation for

art, emotion, adventure, and new experiences. Fifth, Neuroticism is described as tendency to experience negative emotions, such as anger, anxiety, worry, jealously, and/or depression (Jeronimus, Riese, Sanderman & Ormel, 2014). Out of these traits, Neuroticism is shown to influence most parenting behaviours (Belsky, Crnic &Woodworth, 1995). Specifically, mothers who are high in negative emotionality are shown to be associated with rejecting behaviours toward their children (Kochanska et al., 1997). Agreeableness is also shown to influence parenting as it is correlated with sensitive and warm parenting behaviors (Kochanska, Clark & Goldman, 1997; Smith, Spinrad, Eisenberg, Gaertner, Popp & Maxon, 2007). The other three traits are associated with mixed findings with regards to parenting (Extraversion, Belsky & Barends, 2002; Kochanska et al., 2007; Smith et al., 2007; Conscientiousness, Losoya et al., 1997; Smith et al., 2007, Belsky & Barends, 2002; Openness to Experience, Clark, Kochanska, & Ready, 2000; Losyoya et al., 1997; Smith et al., 2007).

Although, the FFM has been widely used to measure personality, it consists of some limitations. For example, the lexical studies that were used to create the FFM only used the English language (Lee & Ashton, 2013), and thus personality adjectives commonly used in other languages and cultures were unaccounted for. After replicating the FFM in other languages and cultures, an additional personality trait was found, known as the Honesty-Humility trait. Therefore, Lee and Ashton (2004) created the HEXACO Personality Inventory (Ashton & Lee, 2004) using principal axis factor analysis with a varimax solution which showed the following six clear personality factors: Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience. The Honesty-Humility factor includes facets such as Sincerity, Fairness,

Greed Avoidance, and Modesty. The Emotionality factor includes facets such as Fearfulness, Anxiety, Dependence, and Sentimentality. The Extraversion factor is similar to its counterpart in the FFM and includes facets such as Social Self-Esteem, Social Boldness, Sociability, and Liveliness. The Agreeableness factor differs from its counterpart in the FFM as it includes facets such as Forgiveness, Gentleness, Flexibility, and Patience. Finally, Conscientiousness factor is similar to its counterpart in the FFM and includes facets such as Organization, Diligence, Perfectionism, and Prudence. Finally, the Openness to Experience factors is also similar to its counterpart in the FFM and includes facets such as Aesthetic Appreciation, Inquisitiveness, Creativity, and Unconventionality. Due to the differences found in the personality loadings within the FFM vs. the HEXACO, it is possible that the established personality- parenting relationship based on the FFM may present differently using the HEXACO.

Current Study

Rationale for Parenting Measures

The literature on parenting consists of parenting styles, parenting values, and parenting practices, that each provides unique information on parenting. For example, parenting styles explain general expectations from and responses to children's behaviours (Baumbrind, 1991), while parenting values explain which characteristics parents value the most in children and how this influences parenting differences (Kohn, 1963). Finally, parenting practices are described as behaviours which parents use with their children that are context specific (Darling & Steinberg, 1993) such as quality of language, sensitivity, expressions of affection, and play behaviour (Bornstein, Hahn & Haynes, 2011). These specific parenting behaviours are theorised to be of most significance for studying

parenting as they may be more stable across contexts (Darling & Steinberg, 1993), influence individual parenting differences (De Haan, Prinzie, & Deković., 2009) and have important effects on children's social, emotional, and cognitive development (Bornstein et al., 2011). Therefore, the present study aimed to examine specific parenting behaviors, such as monitoring, communication, affect and support, in order to capture more stable parenting practices.

Rationale for Naturalistic Observations

In addition, much of the research within the parenting field have usually measured parenting factors using self-reports or laboratory studies and less have used naturalistic observations. Naturalistic observations are suggested to be more reliable when studying parent-child relationships due to less influence from environmental stimuli (Berman, 1980). Moreover, most studies that have used naturalistic observations to study parenting have observed parent-child interactions with toddlers (Kochanska et al., 1997; Clark et al., 2000). Since toddlers require more care and affection due to their low levels of independence, results from these observations may be more reflective of children's dependence on parents rather than individual differences in parenting. Therefore, the present study aimed to obtain naturalistic observations of parenting behaviours with children aged from 2 to 6 years old as children within this age range are relatively less dependent on parental care but still exhibit infantile features which are necessary to study the influence of children's facial cues on parental responses.

Research Questions

To date, the interactive associations between children's facial cues, parent personality, and parent behaviours are relatively unexplored. Therefore, the present study predicted that parents may be predisposed to respond differently to certain facial cues based on their personality traits. This may be because the evolutionary costs and benefits of parenting may present somewhat differently for different personality factors. Thus, I proposed the following research questions and predictions.

1). Do children's level of cuteness, happiness, health, and resemblance to the parent influence parenting behaviours?

2). Do parents' personality traits influence parenting behaviours?

3). Do children's facial cues moderate the relationship between parents' personality and parenting behaviours?

For the first research question, I predicted that children's facial cues will significantly influence parenting behaviours, but children's cuteness will have the strongest effect, similar to previous studies (Volk & Quinsey, 2002; Volk, Lukjanczuk & Quinsey, 2005). For the second research question, I predicted that high levels of Honesty-Humility, Emotionality, and Agreeableness will influence parenting behaviours, but Emotionality will have the strongest effect, based on the theorised relationship between Emotionality and kin relationships (Ashton & Lee, 2007). For the third research question, I predicted that parents' Emotionality and children's cuteness will additively influence parenting behaviours due to the predictions for the previous two research questions.

Methods

Participants

For study 1, a total of 100 participants were recruited from three local parks within the St. Catharines community. The sample of parents included 78 (78%) mothers and 22 (22%) fathers between the ages of 21 and 60+ years. The sample was predominantly White (84%), with a minority of Aboriginal (1%), Asian (2%), Black (2%), Hispanic (4%), and other (7%) ethnicities. In addition, majority of the participants reported their SES level as similar to the average Canadian (53%), while fewer participants reported to be a lot less wealthy (3%), less wealthy (19%), more wealthy (19%), and a lot more wealthy (3%) compared to the average Canadian. The sample of children included 43 (43%) boys and 57 (57%) girls between the ages of 2 and 6 years (M = 3.89 years, SD = .1.04).

For study 2, a total of 180 participants were recruited. 86 of the participants were undergraduate students from Brock University and 94 of the participants were members of the community recruited from public libraries within the Southern Ontario region. The total sample included 100 (55.6%) women and 80 (44.4%) men between the ages of 18 and 60+ years. The sample was predominantly White (50.60%) with a minority of Asian (25.6%), Black (8.9%), Hispanic (1.1%), and other (13.9%) ethnicities. In addition, majority of the participants reported their SES level to be similar to the average Canadian (58.3%), while fewer participants reported to be a lot less wealthy (2.9%), less wealthy (21.7%), more wealthy (15.6%), and a lot more wealthy (1.1%) compared to the average Canadian.

Measures

Study 1

Demographics. Parents completed a demographics questionnaire (Appendix A) that gathered information on participant's age, sex, SES, marital status, number of biological children, length of time as a parent, amount to exposure to the child per week, amount of exposure to other children per week, age of child, and sex of child.

Personality. Parents completed the self-report of the 60-item HEXACO Personality Inventory- Revised (HEXACO PI-R; Appendix B; Lee, & Ashton, 2004). The scaled consists of six factor-level scales of personality. Each factor includes 16 items on a Likert scale ranging from 1-5 (strongly agree- strongly disagree). Sample items include "Having a lot of money is not especially important to me" for Honesty-Humility (sample derived internal consistency, $\alpha = .44$), "I would feel afraid if I had to travel in bad weather conditions" for Emotionality (sample derived internal consistency, $\alpha = .66$), "I feel reasonably satisfied with myself overall" for Extraversion (sample derived internal consistency, $\alpha = .33$), "I rarely hold a grudge, even against people who have badly wronged me" for Agreeableness (sample derived internal consistency, $\alpha = .66$), "I plan ahead and organize things, to avoid scrambling at the last minute" for Conscientiousness (sample derived internal consistency, $\alpha = .53$), and "If I had the opportunity, I would like to attend a classical music concert" for Openness to Experience (sample derived internal consistency, $\alpha = .65$).

Parenting Behaviours. Parenting behaviours were measured through naturalistic observations using a Parenting Observations Form created by the principal student investigator (Appendix C). Parent monitoring was measured by the number of seconds parents looked at their child. Parent communication was measured by the number of positive sentences that parents communicated with their child. Parent affection was

measured by the number of times parents showed affection towards their child (e.g., kissing, smiling, hugging, and playing). Parent support was measured by the number of times parents helped their child (e.g., helped to climb, make friends, provided snack, and responded positively to injury). Parents were also given a subjective overall score on a Likert scale from 1 to 5 on each of the parenting measures. All of the research assistants were trained using 5 sample parent-child observations at a park before the study. The inter-rater reliability for the ratings of each parenting behaviour were calculated using the intra-class correlation coefficient (ICC) and the absolute agreement model. A high degree of reliability was found between raters 1,2, and 3 for each parenting measure and wave of observations. Specifically, the average measure ICC for parent monitoring in wave 1 was 0.94 with a 95% confidence interval from .92 to .96 (F (92, 184) = 16.60, $p < .001$). The average measure ICC for parent communication in wave 1 was 0.92 with a 95% confidence interval from .89 to .95 (F (92, 184) = 12.38, $p < .001$). The average measure ICC for parent affection in wave 1 was 0.89 with a 95% confidence interval from .85 to .92 (F (92, 184) = 9.19, $p < .001$). The average measure ICC for parent support in wave 1 was 0.82 with a 95% confidence interval from .75 to .88 (F (92, 184) = 5.62, $p < .001$). The average measure ICC for parent monitoring in wave 2 was 0.92 with a 95% confidence interval from .89 to .95 (F (92, 184) = 12.95, $p < .001$). The average measure ICC for parent communication in wave 2 was 0.80 with a 95% confidence interval from .72 to .86 (F (92, 184) = 5.03, $p < .001$). The average measure ICC for parent affection in wave 2 was 0.89 with a 95% confidence interval from .84 to .92 (F (92, 184) = 8.89, $p < .001$). The average measure ICC for parent support in wave 2 was 0.85 with a 95% confidence interval from .79 to .90 (F (92, 184) = 6.88, $p < .001$). The average measure

ICC for parent monitoring in wave 3 was 0.92 with a 95% confidence interval from .89 to .94 (F (92, 184) = 12.52, $p < .001$). The average measure ICC for parent communication in wave 3 was 0.90 with a 95% confidence interval from .86 to .93 (F (92, 184) = 10.45, $p < .001$). The average measure ICC for parent affection in wave 3 was 0.83 with a 95% confidence interval from .76 to .88 (F (92, 184) = 5.97, $p < .001$). The average measure ICC for parent support in wave 3 was 0.90 with a 95% confidence interval from .86 to .93 (F (92, 184) = 10.39, $p < .001$). Finally, the average measures ICC for subjective ratings of overall parent morning were rated and agreement was verbally determined.

Study 2

Demographics: Participants completed a demographics questionnaire (Appendix D) which gathered information on their age, sex, SES, and length of time as a parent.

Children's Facial Cues: Participants completed the Facial Cue Rating Scale (Appendix E; Volk & Quinsey, 2002; 2007). It is a measure which asks participants to rate children's cuteness, health, happiness, and resemblance to adult (which was the parent). The cuteness, health and resemblance questions were rated on a Likert scale ranging from 1 to 7 and the happiness question was rated on a Likert scale ranging from 1 to 5 to in order to reduce acquiescence and boredom. An example from this questionnaire is "Please rate the child's face for cuteness".

Procedure

Study 1. After obtaining ethics clearance from the Research Ethics Board at Brock University (Appendix F), the primary student investigator approached participants at parks and informed them that the study was observing children's play behaviour. This use

of deception was necessary in order to reduce social desirability biases in parenting behaviours. Participants who were interested in the study were asked to read and sign the written consent form (Appendix G). In addition, verbal assent was obtained from the children in the study (Appendix H). Next, parents were provided with a $10.00 cash incentive for their participation and were informed that all of the information was confidential, participation in the study was voluntary, and they were allowed to withdraw from the study at any point without penalty (i.e., they can still keep the $10.00 incentive). Next, while the parents completed the questionnaires, the primary investigator and two trained research assistants conducted three waves of schedule-timed observations of parent behaviours. The observations were conducted in durations of 3 minutes at 10 minute, 20 minute, and 30 minute intervals from a standardized distance of 2 meters. Next, photographs of the parents and children were captured using a standardized digital camera. Each photograph was controlled for standard distance and neutral facial expression. Next, participants were provided a debriefing (Appendix I) form which explained the actual goals of the study and the justification for the use of deception. After the reading the debriefing form, parents were asked to sign a second consent form if they were still interested in keeping their data in the study (Appendix J) (none of the participants withdrew from the study). Finally, all of the photographs were converted to black and white images with a neutral background as previous studies have found that black and white photographs provide more accurate ratings (Alvergne, Faurie & Raymond, 2007), especially for detecting facial resemblance (Kaminski, Meary, Mermillod, & Gentaz, 2010). The neutral background was used in order to reduce environmental influences on facial cue ratings. All questionnaires were locked in a filing

cabinet and photographs were stored in a password secured computer, which were only accessed by the primary study investigator.

Study 2. In order to obtain objective ratings of children's facial cues, children's facial cue ratings were collected from undergraduate students and community members as previous studies have found that undergraduate students' and community members' differ in their ratings of facial cues (Volk & Quinsey, 2005). For the undergraduate sample, advertisements of the study (Appendix K) were posted around the Brock University campus which invited participants to the Volk Developmental Science Lab. For the community sample, participants were approached at public libraries and were briefly informed of the study. All participants who were interested in participating were seated at a computer in a private location and were asked to complete the study using the Qualtrics website link. Participants were first asked to read and sign the consent form (Appendix L) and were informed that all of the information was confidential, participation in the study was voluntary, and they were allowed to withdraw from the study at any point without penalty (i.e., they can still keep the $10.00 incentive). Next, participants completed the demographics questionnaires and facial cue ratings. After completing the study, participants received a debriefing form (Appendix M).

Results

Data Analysis

The purpose of this thesis was to determine factors that predict parenting. All of the statistical analyses in this study were conducted using the SPSS Statistics software 22 and the PROCESS macro 2.15 by Andrew F. Hayes. The first and second research questions were examined by conducting bivariate and partial correlations among

demographics (child's age, child's sex, parent's age, parent's sex, SES), children's facial cues (cuteness, health, happiness, and resemblance to parent), and parenting behaviours (monitoring, communication, affection, and support). The third research question was investigated through moderation analyses to examine the moderation effects of children's facial cues on parents' personality and behaviours. Each moderation analysis included covariates (child's age, child's gender, parent's age, and SES), and combinations of one predictor (Honesty-Humility, Emotionality and Agreeableness), moderator (children's cuteness, happiness, health, and resemblance to parent) and outcome variable (parent monitoring, communication, affection and support). Each of the moderator variables were recoded into categories of 25 percentile quartiles due to the limited variability in distribution of the original variables. In addition, subjective and objective measures of each of the four parenting behaviours were standardized and averaged to create total scores for each of the parenting behaviours.

Preliminary analysis

Prior to conducting the moderation analyses, the nature and pattern of missing values for data sets in Study 1 and Study 2 were evaluated. In Study 1, four cases were missing 100% of data on the HEXACO and three participants were missing two or more of the three waves of naturalistic observations. Therefore, these 7 cases (7%) were deleted which reduced the sample size from 100 to 93. T-tests revealed that these cases were missing at random as no significant group differences were found (Tabachnick & Fidell, 2007). Next, Little's MCAR test was conducted on all variables and indicated support for a non-problematic pattern of missing data ($p > .05$). On average 0.42% of cases were missing data on each variable and thus a single imputation was implemented.

For Study 2, Little's MCAR test showed a non-problematic pattern of missing data ($p > .05$) with an average of 1.20% of missing data for each variable. Therefore, a single imputation was applied. Next, a MANOVA was conducted to assess whether undergraduate student and community ratings significantly differed from each other on all of the facial cues. All of the assumptions for a MANOVA were met (independence, multivariate normality, and multivariate outliers) for all variables except for homogeneity of variance. The Levene's test violated the homogeneity of variance ($p = .001$) for the health variable. The community group showed higher variance possibly because the community sample had a wider range in the length of time as parents ($SD = 2.08$) compared to undergraduate students ($SD = .11$). Therefore, various levels of exposure to biological children may have influenced the wider range of sensitivity for children's health. However, due to the combined ratings for undergraduate and community raters, this violation was ignored.

The results showed that there was a statistically significant difference in the ratings of undergraduate and community samples, $F(4,170)= 4.65$, $p = .001$; Roy's Largest Root = .00, partial $\eta^2 = .10$. The differences were found in the health ($p < .05$, partial $\eta^2 = .02$) and happiness ($p = .001$, partial $\eta^2 = .06$) ratings. Differences between undergrad and community ratings were expected and supported by previous literature (Volk & Quinsey, 2005). This was probably because community raters were older than undergraduate raters (community $M = 3.90$, $SD = 1.28$; undergraduate $M = 2.01$, $SD = .11$) (see Table 1 for age coding) and consequently may have had relatively higher levels of exposure to children (own children, career involving children, and/or contact with children of friends and relatives) and thus may have higher sensitivity (or possible

concern) for children's level of health and happiness. Next, data sets from study 1 and study 2 were combined and further analysed.

Univariate Assumptions: All of the independent and dependent variables were screened for univariate assumptions including missing values, normality, skewness, kurtosis, and outliers. Outliers were identified in the health, Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience variables. In addition, the health, happiness, Honesty-Humility, Emotionality, Agreeableness, total parental affection, and total parental support variables did not meet the assumption of normality. All other assumptions were met. Since the outliers did not significantly differ from the non-outliers with regards to facial cue ratings, SES, and age when examined through t-tests (all $p < .05$), they were winsorized (Fields, 2013), such that any values above or below 2.5 standard deviations were replaced with the raw score that was closest to that extreme score, in order to decrease the impact of the outliers and sustain the variability of the original values. In order to adjust for normality, various levels of transformations such as log, square root, reverse and reciprocal transformation were appropriately implemented on the problematic variables. However, the transformations created additional outliers and did not help with the normality of the Agreeableness variable. Further, there were no differences in the moderation results when they were conducted with the transformed and non- transformed variables. Therefore, the original variables were used with the statistical justification that the skewness and kurtosis for these variables were all within the acceptable limits (below 1) (health, skewness = .16, kurtosis = .09; happiness, skewness = .66, kurtosis = -.18; Honesty-Humility, skewness = -.60, kurtosis = .56; Emotionality, skewness = -.81, kurtosis = -.05;

Agreeableness, skewness = -.34, kurtosis = .25; total parental affection, skewness = .63, kurtosis = -.68; total parental support skewness = .64, kurtosis = -.21) and the theoretical justifications that parents are assumed to be higher on the Honesty-Humility, Emotionality, and Agreeableness traits compared to the normal population and children at a park may be healthier and happier compared to children in other environments.

Multivariate Assumptions: All of the dependent variables were screened for multivariate assumptions including normality, outliers, homoscedasticity, independence, and collinearity. No problematic extreme multivariate outliers were identified through the examination of the Mahalanobis Distance, a Durbin-Watson value of 1.72 suggested for independence, and regression residual plots indicated that the assumptions of normality and homoscedasticity of residuals were satisfied. There was an initial concern for collinearity as the cuteness, health, and happiness variables showed bivariate correlations just over the suggested value of .7 (cuteness and health r = .75; health and happiness r = .73) according to Tabachnick & Fidell (2007). However, these variables were kept in the analysis due to acceptable collinearity diagnostic values and because they were not included as predictor variables within the same moderation analyses.

Descriptives and Correlations

The sample (N = 93) was explored by examining demographics, children's facial cues, parents' personality traits, and parents' behaviours through bivariate (see Table 2) and partial (see Table 3) correlations to investigate research questions 1 and 2.

Demographics and Children's Facial Cues: Pearson r indicated that there was a relationship between children's age and facial cues. Children's level of cuteness showed a

small negative correlation with age (r = -.22, p < .05) and a positive moderate correlation with facial resemblance to parent (r = .22, p < .05). In addition, small positive correlations were found between parents' age and children's level of health (r = .21, p < .05) and happiness (r = .21, p < .05). Finally, small to moderate positive correlations were found between SES and children's level of cuteness (r = .28, p < .05) and health (r = .24, p < .05).

Demographics and Parent Personality: Pearson *r* indicated that there was a relationship between parents' age and Honesty-Humility (r = .21, p < .05).

Demographics and Parent Behaviours: Pearson *r* indicated that there was a relationship between parenting behaviours and children's age. Children's age was negatively correlated with parent monitoring (r = -.21, p < .05), communication (r = -.26, p < .05), and support (r = -.33, p = .001).

Children's facial cues and Parent Behaviours: Pearson *r* indicated that there was a relationship between children's level of happiness and parent monitoring (r = .21, p < .05). To further investigate this relationship, partial correlations were conducted between children's facial cues and parent behaviours by controlling for children's perceived level of behavioural happiness (happiness ratings given by the researchers based on children's behaviour in the parks). The partial correlation did not find a significant relationship between children's level of happiness and parent monitoring.

Parent Personality and Parent Behaviours: Pearson *r* indicated that there was a relationship between Honesty-Humility and parent affection (r = .24, p < .05).

Table 1

Means and Standard Deviations for all Continuous Variables (N = 93)

	M	(SD)
Demographics		
Child age	3.87	(1.03)
Parent age range[a]	2.88	(.66)
Socio-economic status[b]	2.98	(.78)
Children's facial cues		
Cuteness	4.49	(.54)
Health	4.54	(.41)
Happiness	2.89	(.68)
Resemblance to parent	4.04	(.68)
Parents' Personality		
Honesty-Humility	4.01	(.43)
Emotionality	3.48	(.57)
Extraversion	3.80	(.36)
Agreeableness	3.56	(.52)
Conscientiousness	4.01	(.40)
Openness to Experience	3.74	(.57)
Subjective Parenting Behaviour[c]		
Monitoring	3.62	(1.15)
Communication	3.02	(1.15)
Affection	2.92	(1.35)
Support	2.78	(1.33)
Objective Parenting Behaviour[d]		
Monitoring	77.65	(42.40)
Communication	5.37	(4.40)
Affection	2.32	(2.15)
Support	1.00	(.98)

Notes. [a] Parent age was coded with 1 = less than 20 years, 2 = 21-30 years, 3 = 31-40 years, 4 = 41-50 years, 5 = 51-60 years, 6 = 60 years and over

[b] Socio-economic status was coded with 1 = a lot less wealthy than the average Canadian, 2 = less wealthy than the average Canadian, 3 = about the same as the average Canadian, 4 = more wealthy than the average Canadian, 5 = a lot more wealthy than the average Canadian.

[c] Subjective parenting behaviours were rated on a scale from 1-5

[d] Objective parenting behaviours were measured through the frequency of each behaviour

Table 2

Bivariate Correlations between all Independent and Dependent Variables (n = 93).

		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1.	Child Age	.06	.01	-.22*	-.14	-.12	.22*	-.03	.01	-.05	-.06	-.08	-.18	-.21*	-.26*	-.13	-.33**
2.	Parent Age	-	.13	.10	.21*	.21*	-.09	.21*	-.05	.13	-.07	.11	.19	.06	-.04	-.08	-.06
3.	SES		-	.26**	.24*	.07	.11	.02	.16	.07	.07	.07	.14	-.10	-.13	-.06	.14
4.	Cuteness			-	.76**	.62**	.00	.07	-.12	.02	.08	-.04	.05	.10	.08	.15	.15
5.	Health				-	.73**	.10	.06	-.03	-.07	.08	.03	.07	.05	.05	.06	.11
6.	Happiness					-	.10	.06	.05	.06	.03	-.04	.07	.21*	.14	.13	.11
7.	Resemblance						-	-.15	.10	.06	-.04	-.01	-.09	-.06	-.04	.00	.01
8.	Honesty-Humility							-	.33**	.07	.07	.23*	.15	.20	.06	.24*	.01
9.	Emotionality								-	.12	-.00	.24*	.12	-.02	-.03	-.11	.06
10.	Extraversion									-	.12	.13	.16	.00	-.07	-.07	-.04
11.	Agreeableness										-	-.15	.14	.11	-.02	.14	.07
12.	Conscientiousness											-	.12	.00	-.07	-.07	-.05
13.	Openness to Experience												-	-.00	-.11	-.10	-.08
14.	Total Monitoring													-	.76**	.67**	.58**
15.	Total Communication														-	.75**	.80**
16.	Total Affection															-	.67**
17.	Total Support																-

Note. * $p < .05$. ** $p < .01$.

Table 3

Partial Correlations when controlled for children's behavioral happiness

		2	3	4	5	6	7	8
1.	Cuteness	.66**	.47**	-.02	-.04	.01	.08	.20
2.	Health	-	.62**	.10	-.12	-.05	-.06	.11
3.	Happiness		-	.10	-.05	.05	.04	.17
4.	Resemblance			-	-.06	-.02	.05	.03
5.	Total Monitoring				-	.75**	.64**	.57**
6.	Total Communication					-	.74**	.77**
7.	Total Affection						-	.65**
8.	Total Support							-

Note. ** $p < .01$.

Interactive Effects

Moderation analyses were conducted in which parent age, child age, child sex, and SES, were entered as covariates across all analyses. Each of the facial cues (cuteness, happiness, health, and resemblance) was examined as individual moderators of the relationship between parents' personality (Honesty-Humility, Emotionality, and Agreeableness) and parent behaviours (monitoring, communication, affection, and support). The following interactions showed significant results.

Honesty-Humility: Children's health was positively related to parental affection, $\Delta R^2 = .14$, $F(7, 82) = 2.15$, $p < .05$ (see Table 4). The simple slopes analysis revealed that Honesty-Humility was more strongly related to parent affection for high levels of health ($b = 1.24$, $t(82) = 3.25$, $p = .00$) compared to moderate ($b = .69$, $t(82) = 2.35$, $p = .02$) or low ($b = .15$, $t(82) = .41$, $p = .68$) levels of health (see Figure 1).

Table 4

Moderation analysis of the interaction of Honesty-Humility and Children's health on parent affection

	b	*SE B*	*t*
Constant	1.47	.75	1.20
	[-.02, 2.96]		
Health (centred)	.02	.09	.24
	[-.15, .19]		
Honesty-humility	.69*	.29	2.35
(centred)	[.10,1.28]		
Health X Honesty-	.48*	.20	2.39
Humility	[.08, .88]		
Child's age	-.11	.10	-1.04
	[-.32, .10]		
Child's Sex	-.17	.20	-.84
	[-.56, .23]		
Parent's age	-.21	.16	-1.32
	[-.52, .10]		
SES	-.07	.13	-.54
	[-.32, .19]		

Note. $R^2 = .14$. * $p < .05$.

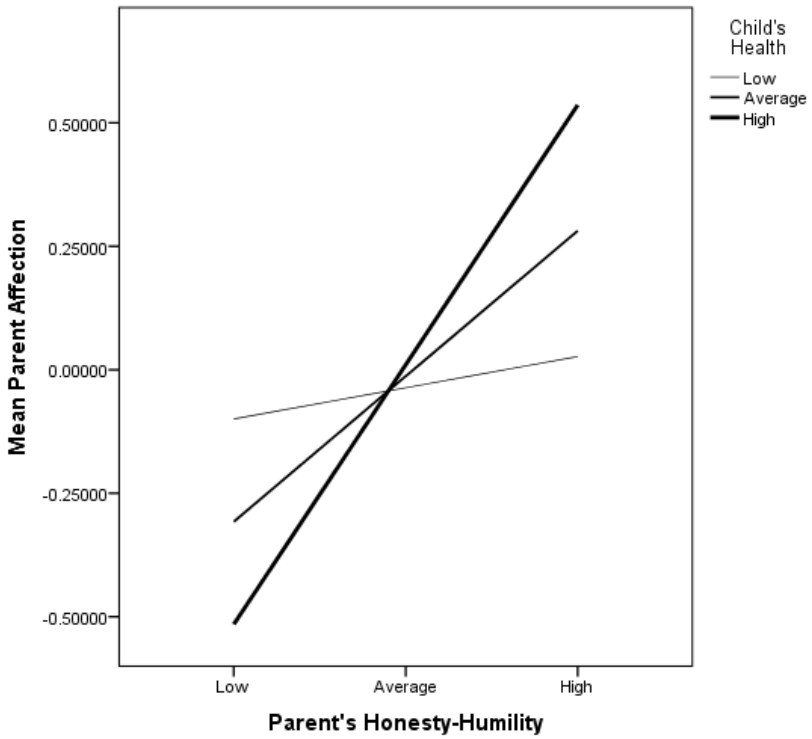

Figure 1. Simple slopes of Honesty-Humility predicting parent affection for 1 *SD* below the mean of children's health, the mean of children's health, and 1 *SD* above the mean for children's health.

Emotionality: Children's happiness was positively related to parent monitoring, $\Delta R^2 = .16$, $F(7, 82) = 2.70$, $p < .05$ (see Table 5). A simple slopes analysis indicated that Emotionality was positively related with parent monitoring at low levels of happiness ($b = .44$, $t(82) = 2.29$, $p = .03$). However, Emotionality was negatively related with parent monitoring at high ($b = -.50$, $t(82) = -2.16$, $p = .03$) and moderated ($b = -.03$, $t(82) = -.20$, $p = .84$) levels of happiness (see Figure 2).

Table 5

Moderation analysis of the interaction of Emotionality and children's happiness on parent monitoring

	b	*SE B*	*t*
Constant	1.16	.68	1.70
	[-.20, 2.51]		
Happiness (centred)	.08	.09	.95
	[-.09, .25]		
Emotionality (centred)	-.03	.16	-.20
	[-.35, .29]		
Happiness X Emotionality	-.42*	.12	-3.37
	[-.66, -.17]		
Child's age	-.20*	.10	-2.04
	[-.40, -.01]		
Child's Sex	-.21	.12	-1.66
	[-.40, -.01]		
Parent's age	-.02	.19	-.12
	[-.31, .30]		
SES	.10	.16	.63
	[-.45, .03]		

Note. $R^2 = .16$ * $p < .05$.

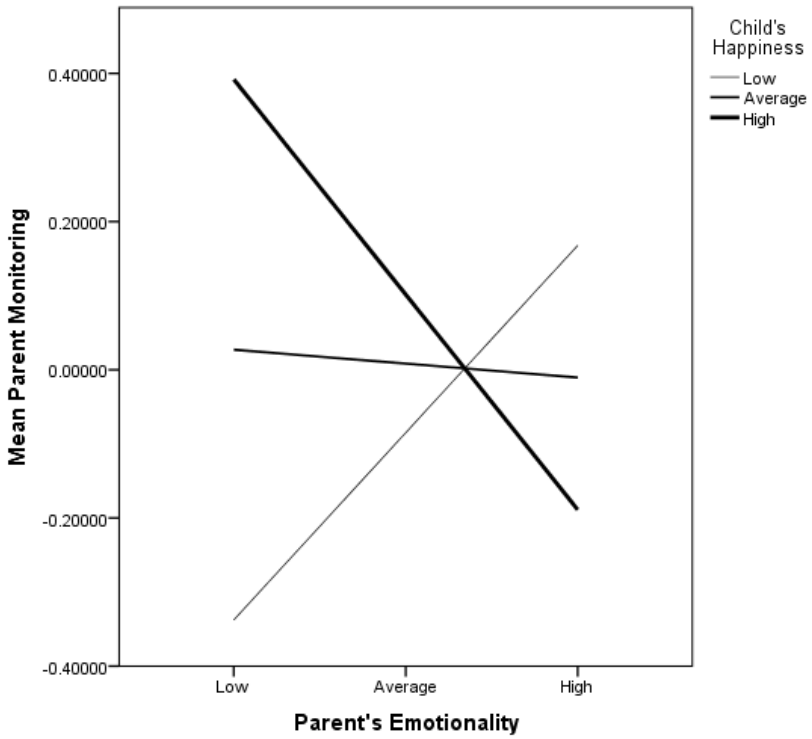

Figure 2. Simple slopes of Emotionality predicting parent monitoring for 1 *SD* below the mean of children's happiness, the mean of children's happiness, and 1 *SD* above the mean for children's happiness.

Since I predicted that Emotionality would have the strongest relationship with parent behaviours, I further investigated the interactive effects of the different facets of Emotionality on parent behaviours by creating two composite variables of the original four facets of the Emotionality factor. The first composite variable was labeled Emotionality: Worry, which combined the Fearfulness and Anxiety facets. The second composite facet was labeled Emotionality: Attachment, which combined the Dependence and Sentimentality facets.

Emotionality: Attachment: First, Emotionality: Attachment was positively related to parent monitoring, $\Delta R^2 = .19$, $F(7, 82) = 2.69$, $p = .01$ (see Table 6). A simple slopes analysis indicated that at high levels of happiness, there was a significant negative relationship between Emotionality: Attachment and parent monitoring ($b = .49$, $t(82) =$ -

2.82, $p = .01$) (see Figure 3). However, there was no significant relationship between Emotionality: Attachment and parent monitoring at moderate ($b = -.02$, $t(82) = -.18$, $p = .86$) and low ($b = .44$, $t(82) = 1.90$, $p = .06$) levels of children's happiness.

Table 6

Moderation analysis of the interaction of Emotionality- Attachment and children's happiness on parent monitoring

	b	*SE B*	*t*
Constant	1.08 [-.29, 2.46]	.69	1.56
Happiness (centred)	.07 [-.10, .24]	.09	.81
Emotionality- Attachment (centred)	-.03 [-.31, .26]	.14	-.18
Health X Emotionality-Attachment	-.4094** [-.66, -.15]	.13	-3.19
Child's age	-.20 [-.40, -.00]	.10	-2.00
Child's gender	-.0630 [-.43, .31]	.19	-.34
Parent's age	.16 [-.17, .48]	.16	.97
SES	-.21 [-.46, .04]	.13	-1.71

Note. $R^2 = .19$. ** $p < .01$.

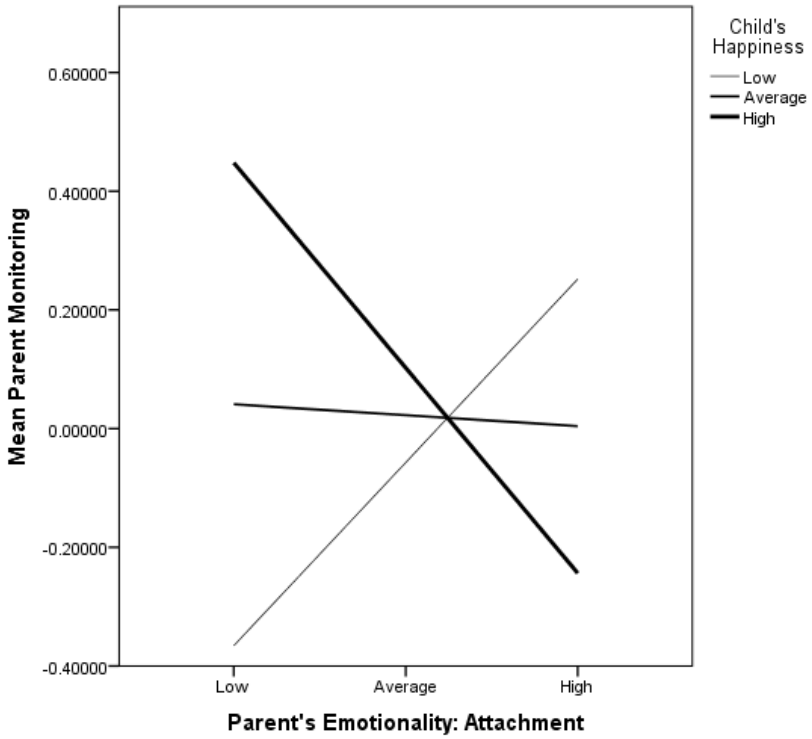

Figure 3. Simple slopes of Emotionality: Attachment predicting parent monitoring for 1 *SD* below the mean of children's happiness, the mean of children's happiness, and 1 *SD* above the mean for children's happiness.

Second, Emotionality: Attachment was positively related to parent support, ΔR^2 = .28, $F(7, 82) = 3.93$, $p = .001$ (see Table 7). A simple slopes analysis indicated that at low levels of happiness, there was a significant negative relationship between Emotionality: Attachment and parent support (b = .-.42, $t(82) = -2.01$, $p = .05$) (see Figure 4). However, there was no significant relationship between Emotionality: Attachment and parent support at moderate (b = -.02, $t(82) = -.17$, $p = .86$) and low (b = .19, $t(82) = 1.94$, p = .06) levels of children's health.

Table 7

Moderation analysis of the interaction of Emotionality- Attachment and children's happiness on parent support

	b	*SE B*	*t*
Constant	1.66*	.77	2.15
	[.12, 3.19]		
Happiness (centred)	-.01	.09	-.11
	[-.18, .16]		
Emotionality-Attachment (centred)	-.02	.14	-.17
	[-.31, .26]		
Health X Emotionality-Attachment	-.35*	.12	-2.86
	[-.59, -.11]		
Child's age	-.30*	.09	-3.21
	[-.48, -.11]		
Child's gender	-.4851*	.19	-2.56
	[-.86, -.11]		
Parent's age	-.01	.16	-.06
	[-.32, .30]		
SES	.10	.13	.73
	[-.17, .37]		

Note. $R^2 = .28$. * $p < .05$.

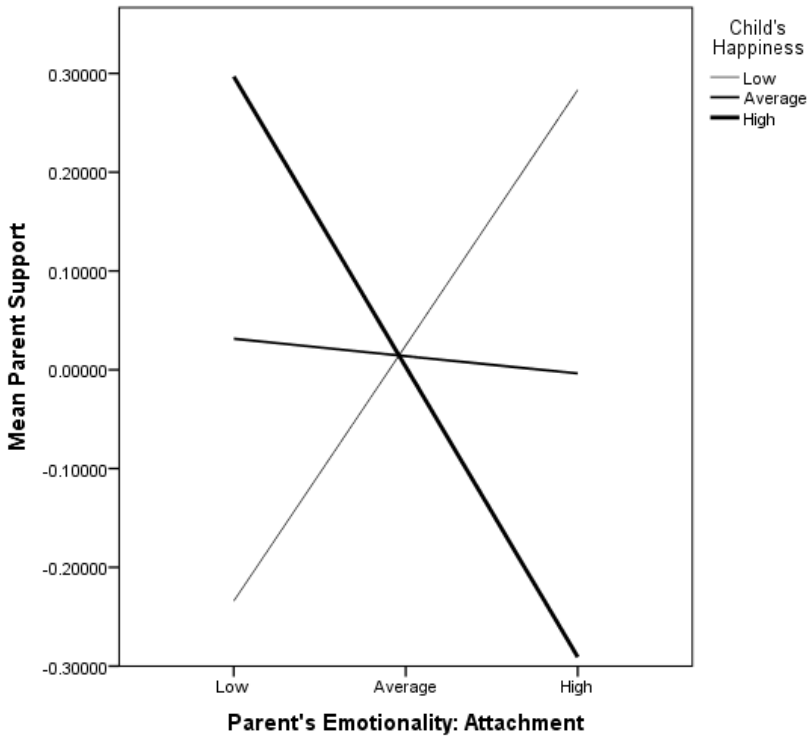

Figure 4. Simple slopes of Emotionality: Attachment predicting parent support for 1 *SD* below the mean of children's happiness, the mean of children's happiness, and 1 *SD* above the mean for children's happiness.

Emotionality: Worry: Emotionality: Worry was positively related to parent monitoring, $\Delta R^2 = .26$, $F(7, 82) = 3.67$, $p < .05$ (see Table 8). A simple slopes analysis indicated that Emotionality: Worry was more positively related with parent support at high levels of children's health ($b = .37$, $t(82) = 2.08$, $p = .04$) compared to moderate levels ($b = .04$, $t(82) = .27$, $p = .79$) (see Figure 5). However, Emotionality: Worry was negatively related with parent support at low levels of children's health ($b = -.28$, $t(82) = -1.19$, $p = .03$).

Table 8

Moderation analysis of the interaction of Emotionality- Worry and children's health on parent support

	b	*SE B*	*t*
Constant	1.53	.79	1.95
	[-.03, 3.10]		
Health (centred)	-.01	.09	-.13
	[-.18, 16]		
Emotionality- Worry (centred)	0.04	.16	.27
	[-.27, .35]		
Health X Emotionality-Worry	.29*	.12	2.30
	[.04, .53]		
Child's age	-.30*	.09	-3.33
	[-.47, .12]		
Child's gender	-.45*	.20	-2.25
	[-.86, -.05]		
Parent's age	-.05	.15	-.36
	[-.35, .25]		
SES	.17	.13	1.25
	[-.10, .44]		

Note. $R^2 = .26$. * $p < .05$.

Figure 5. Simple slopes of Emotionality: Worry predicting parent support for 1 *SD* below the mean of children's health, the mean of children's health, and 1 *SD* above the mean for children's health.

Discussion

This thesis aimed to apply a developmental and personality perspective, wrapped in an evolutionary framework, to investigate the influence of individual parenting differences (personality) and children's characteristics (facial cues) on parenting behaviours. Four parenting measures (monitoring, communication, affection, and support) were examined in order to examine a wide range of parenting behaviours. This study contributes to the literature on parenting as it incorporates the HEXACO personality inventory, which is understudied in the parenting field. In addition, this study is among the few to use naturalistic observations of parenting behaviour using both subjective and objective measures (Bornstein Hahn & Haynes., 2011; Bressan et al., 2009; Harrell, 2005; Leinbach & Fagot 1991; Langlois et al., 1995). The overall

prediction of this study was that the Emotionality trait in parents and children's level of cuteness will independently and interactively have the strongest effects on parenting behaviours when compared with other personality traits and children's facial cues. Findings and implications for each research question and secondary findings and are outlined below.

Demographics and independent and dependent variables

Zero-order correlations showed significant relationships between demographics and independent and dependent variables. First, a small positive relationship was found between children's age and resemblance to the parent. This finding is consistent with past literature which suggests that infants and young children, compared to older children, resemble a wider range of adults (Bressan & Kramer, 2015; Pagel, 1997; Volk & Quinsey, 2007) possibly as a mechanism to elicit perceptions of relatedness and extract care from maximum number of adults due to younger children's vulnerability and dependence on parental care. Thus, as the children's minimum age in the present study was relatively older than infancy, they may have started to develop facial features that more closely resemble their parents. Second, the present study found that children's age had a small negative relationship with cuteness, as found in previous studies (Luo et al., 2011). This is probably because younger children are theorised to have higher levels of baby schema which influences a 'cuter' appearance (Lorenz, 1943). From an evolutionary perspective, it is advantageous for younger children, compared to older children, to appear cuter so that they can acquire higher quality and quantity of care from adults due to high mortality rates in infancy (Attard-Montalto & Saha, 1999). Third, the present study found that children's age showed small to moderate positive relationships with

parent monitoring, communication, and support. Previous studies have similarly found that younger children receive higher levels of care (Poirier, 1972) possibly due to the higher levels of infantile facial features (Lorenz, 1943) which makes them appear to be cuter, and thus results acquiring higher levels of investment. Moreover, parents may also recognize that younger children are less independent than older children and thus require more parental care.

This study also found that parents' age showed a small positive correlation with Honesty-Humility. This is similar to previous studies which have also found small to moderate correlations between Honesty-Humility and age (Schyns & Sanders, 2007), suggesting that as individuals get older, they may be less interested in engaging in deviant and manipulative behaviours possibly due to higher costs from engaging in such behaviour in adulthood (e.g., divorce, losing job and/or social resources). Parents' age also showed small positive relationships with children's health and happiness. This may be because parents are more likely to gain more parental experience as they get older due to greater exposure to (own or other) children, which allows them to better recognize their children's needs, and thus, influence children to appear healthier and happier.

Finally, parents' SES showed modest correlations with children's health and cuteness. Previous studies have similarly found that SES positively influences children's physical and cognitive development (Mayer, 1997; Yeung, Linver, & Brooks-Gunn, 2002). Previous studies have also found that cues of cuteness and health are significantly correlated (Volk & Quinsey, 2005). Therefore, it can be suggested that better financial resources could positively influence better quality of care for children, including providing necessary medical care and nutrition, which may influence a healthier and cuter

appearance. However, as previous studies have found large effects between children's cuteness and adults' perceptive and behavioural interactions (Chin et al., 2006; Luo et al., 2011; Volk, 2009), less cuter children may be associated with less positive adult-child interactions (Leinbach & Fagot, 1991) which can have important implications on children's development. Therefore, the relationship between parents' SES and children's level of cuteness should be further explored in future studies.

Children's facial cues and parenting behaviours: Hypothesis 1

The first prediction was that children's cuteness, happiness, health, and resemblance to parent will be associated with each of the parenting behaviours, and cuteness will have the strongest effect. The results showed that only happiness had a small correlation with monitoring. Parent monitoring was correlated with happiness, as opposed to the other parenting behaviours, possibly because monitoring may be most imperative to children's safety and security in a park, where children are highly mobile and social. Parents may be more motivated to monitor and invest in the happiest offspring, rather than the cutest offspring, because from an evolutionary perspective, cues of (un)happiness may be the most visible sign of children's of distress, and. Thus, parents may have adapted heightened sensitivity toward cues of (un)happiness over other facial cues in order to provide care and protection for offspring with high (mental and physical) health. Further, due to the modest correlation between children's facial and behavioural happiness, small to moderate correlations between children`s behavioural happiness and all parenting behaviours, and non-significant partial correlations between facial cues and parenting behaviours when controlled for children's behavioural happiness, it can be suggested that children's happiness may over power other facial cues

when concerning important caregiving behaviours such as ensuring children's safety (Parsons et al., 2014; Volk & Quinsey, 2002). From a social perspective, parents may be less motivated to care for unhappy children, regardless of children's level of cuteness, simply due to less pleasant parent-child interactions as unhappy children are shown to be associated with low levels of parent-child bonding, attachment (Gusella, Muir & Tronick, 1988), positive emotions (Frodi et al., 1978), and high levels of long-term parental stress (Koenig, Barry & Kochanska, 2010).

The present study did not find any main effects between three of the facial cues (cuteness, health and resemblance) and parenting behaviours possibly due to the relatively older children used in the present study compared to previous studies, which usually used infants. This may have affected the results as various researchers have theorised that the influence of facial cues on caregiving behaviours declines with age (Bjorklund, 2009; Poirier, 1972) possibly because older children may not require the same amount of parental care for survival compared to younger children.

Additional reasons for the null main effects between cuteness and parenting behaviours, contrary to previous studies, such as Bornstein et al. (2011) and Langlois et al. (1995), which used naturalistic observations to examine parent child interactions, could be due to the following reasons. First, Bornstein et al. and Langlois et al. both observed maternal behaviour at home while the present study examined parental behaviour at a park. Parent-child interactions may present differently at home than at a park as mothers may be providing and displaying more positive caregiving behaviours at the home since children in the parks may be interacting less with parents and more with other children. Second, Bornstein et al. and Langlois et al. used relatively younger

children compared to the present study which may have increased the degree and frequency of caregiving behaviours seen by parents and the level of infantile features in children (Lorenz, 1943). Third, Bornstein et al. and Langlois et al. examined parent-child interactions in only first-born children while the present study did not control for birth order. First –born children may be receiving more attention from parents as parents may be transferring caregiving responsibilities of later born children to the older siblings in the families (Kalliopuska, 1984; Price, 2007). Fourth, even with the use of deception in the present study, parents may have been aware that their behaviours were being observed. For example, one research assistant overheard a parent disclose to another parent (who was not a participant in the study) that he suspects that the observers are observing him due to the questions on the HEXACO such as, "If I knew that I could never get caught, I would be willing to steal a million dollars". In addition, another parent disclosed to the researchers after the observations that she suspected that the study was observing her behaviour. Therefore, a social desirability bias may have inflated parenting behaviours for both cute and less cute children. However, this explanation for the non-significant results between cuteness and parenting behaviours may be less likely as participants in the studies by Bornstein et al. and Langlois et al. may have also been influenced by a social desirability bias since these studies did not use any deception. Sixth, parental perceptions of cuteness may matter more than observer perceptions of facial cues. For example, even if a child appears to be cute to a stranger, the child's bad temperament may influence parents to perceive the child to be less cute and thus show less positive behaviours as a consequence.

Additionally, the present study did not find a main effect between children's facial resemblance to parent and parenting behaviours, even for paternal behaviour, contradictory to previous studies (Collette et al., 2001; Platek et al., 2005; Volk et al., 2010). One reason could be that the present study did not measure fathers' perceptions of self-resemblance to children. Parent-child facial resemblance may play a more important role in father-child interactions due to risks of paternity uncertainty (Geary, 2006). Studies have found that increased exposure to offspring can increase fathers' perceptions of facial resemblance to the offspring, possibly as a psychological mechanism to reinforce paternity certainty in order to justify the increased time and energy spent on the child. Therefore, fathers' subjective perceptions of resemblance may over-ride objective perceptions of resemblance. An alternate reason for the non-significant relationship between resemblance and parent behaviours could be that children's physical behaviour at the park has a stronger effect on parenting behaviour compared to perceptions of resemblance. For example, children's level of independence, sociability and happiness showed small to moderate effects on parenting behaviours in the present study while facial resemblance did not have any effect. Thus, environmental factors may account for more variance in parenting behaviours compared to genetic factors (Harlaar et al., 2008). In other words, even if a child strongly resembles the parent, the children's behaviour at a park (e.g., level of independence and sociability) may be off-setting the influence on parenting behaviours. Also, children who look like the parent may in turn have the similar behaviours as the parent, which could be another reason for children's behaviours influencing parent behaviours more than cues of resemblance.

Finally, the non-significant relationship between children's health and parenting behaviours found in this study was contrary to previous studies (Volk et al., 2005; Waller et al., 2004). This could be explained by the limited variability in children's health (*SD* = .41). Studies have found that children's level of body weight significantly influenced hypothetical adoption decisions when they digitally manipulated children's body weight in photographs to simulate cues of low, high, and average body weight (Volk et al., 2005) and that children's facial features influenced ratings of hypothetical adoption when they were morphed to resemble features of FAS and normal faces (Waller et al., 2004). Anecdotally, none of the children in the present study appeared to be noticeably underweight/overweight or have any abnormal facial features. Thus, raters in the present study may have had difficulty in assessing children's level of health from non-morphed photographs. In addition, since children's age in the present study were relatively higher compared to previous studies that examined the relationship between children's health and investment decisions, parents in the present study may have discovered health related issues of children overtime, which may not have been apparent when external judges merely viewed photographs of the children's faces.

Parent personality and parenting behaviours: Hypothesis 2

My second prediction was that Honesty-Humility, Emotionality, and Agreeableness will be associated with parenting behaviours, and Emotionality will have the strongest effect. The results showed that only Honesty-Humility had a small effect on parent affection. Brook et al. (2001) similarly found that certain descriptions of facets of high Honesty-Humility, such as low rebelliousness and deviance, were associated with strong parent-child attachment (Brook et al., 2000). Perhaps parents high on Honesty-

Humility may be more likely to show parental investment through affectionate behaviours and less likely through monitoring and supportive behaviours as the latter may be more closely related to children's safety, and parents high on Honesty-Humility have less concerns/worries regarding children's safety. Rather, parents high on Honesty-Humility may be more concerned with genuinely providing care for offspring (based on the sincerity, greed-avoidance, fairness, and modesty facets of the Honesty-Humility trait; Ashton, Lee, Perugini, Szarota, deVries, DiBlas, 2004) for the sole purpose of the offspring's well-being rather than for ulterior motives such as receiving positive appraisal or social status from others.

One explanation for the non-significant relationship between Agreeableness and parenting behaviours, contradictory to previous findings which used the FFM (Prinzie , Stams, Dekovic, Reijntjes & Belsky, 2009), may be because the sentimentality-related traits which were present in the Agreeableness factor of the FFM are now included in the Emotionality factor of the HEXACO (Ashton & Lee, 2007). Therefore, the Agreeableness trait in the HEXACO specifically pertains to establishing positive relationships in general. Subsequently, although there may have been opportunities for parents' behaviours to be motivated by revenge and/or anger (e.g., when children do not obey the parent) in the present study, parental behaviours as a result of these interactions may not have been detected in the present study due to social desirability effects.

Some explanations for the non- significant main effect between Emotionality and parenting behaviours may be because the sample of parents in the present study had higher levels of Emotionality and less variability in this trait (M = 3.48, SD = .57) compared to the average population (M = 2.87, SD = .64, Ashton & Lee, 2009), which

may have elevated the overall Emotionality score and made the differences in parenting behaviours based on Emotionality less statistically detectable. Another explanation could be that factors related directly to kin such as children's facial cues, may be driving this relationship. This is supported by De Haan, Prinzie & Dekovic (2009) who provided a similar suggestion with regards to the relationship between parental warmth (which is similar to the Sentimentality facet of the Emotionality trait) and parenting behaviours, such that the relationship may only be detected when other variables are accounted for. Put differently, the effect of Emotionality on parenting behaviours may be conditional on kin-related factors. For example, Emotionality and parenting behaviours may be related for cuter or happier children but not for less cute or less happy children. In addition, the worry-related (fearfulness and anxiety) and attachment-related (dependence and sentimentality) facets within the Emotionality trait may have opposing effects on specific parenting behaviours. For example, parents who are high on fearfulness and anxiety may have different motivations (e.g., provide more care for children who are in immediate danger) for offspring investment compared to parents high on dependence and sentimentality (e.g., provide more care for children who are emotionally distant to the parent). Thus, the combination of worry and attachment related traits within the Emotionality factor may have had distinct effects on specific parenting behaviours (see below).

Children's facial cues as a moderator: Hypothesis 3

In addition to the main effects between certain parent personalities and children's facial cues, I predicted that their interactions will also significantly contribute to

parenting behaviours, and the interaction of Emotionality and cuteness will show the largest effect. The present study found the following results.

Honesty-Humility: This study found that children's health moderated parents' Honesty-Humility and affection. Specifically, high levels of children's health were positively associated with parents' Honesty-Humility and affection more than moderate levels of children's health. In conjunction with the small main effect found between parents' Honesty-Humility and affection, these results collectively suggest that parents high on Honesty-Humility may be predisposed to showing (genuine) affection to offspring and may be showing the most affection to the healthiest offspring. Evolutionary theories suggest that the main cost of being high in Honesty-Humility is missing opportunities to exploit others and thus acquiring resources, which may lower chances of one's chances of survival (Ashton et al., 2004). Such costs are theorised to be more inflated in an uncertain environment. For parents, the uncertain environment may be uncertainty regarding offspring survival, such as cues of low health. Therefore, parents high on honesty-humility may be predisposed to compensating for their risk of low survival by investing in the healthiest offspring in order to indirectly maximize their fitness.

Emotionality: This study also found that children's happiness moderated Emotionality and monitoring. High levels of children's happiness showed a negative relationship with parent monitoring while low levels of children's happiness showed a positive relationship with parent monitoring. In other words, parents high on Emotionality monitored the less happy children more than the happier children, while parents low on Emotionality monitored the happier children more than the less happy

children. These results strengthen the argument made earlier regarding the lack of main effects between Emotionality and parenting behaviours, in that the association may be detected only when certain characteristics directly related to the kin are accounted for. In this case, children's level of happiness may be driving the relationship between Emotionality and parenting behaviours. Moreover, this result helps to strengthen the theorised relationship between Emotionality and parenting (Lee & Ashton, 2004) because although evolutionary theories generally suggest that it may be less beneficial (for parental fitness) to invest in offspring who seem less happy, due to possible mental and physical health concerns (Davison & Neale, 1994; Power et al., 1982), parents high on Emotionality may still be motivated to provide care to these offspring due to their strong affinity toward kin relationships. In contrast, since low Emotionality describes emotional detachment, parents low on this trait may feel further emotional detachment from less happy children.

Emotionality is linked to monitoring in the present study, as opposed to the other parenting behaviours, possibly because high Emotionality is concerned with kin relationships, and children's safety at a park is highly dependent on the level on parental monitoring to ensure that the child is not interacting with a stranger and/or did not hurt him/herself. However, parent support may also be related to children's safety at a park to a slightly lesser degree, as it was measured by number of times the parents helped their children. So why didn't parent support show any links with Emotionality? Further exploration of the Emotionality trait helps to answer this question.

Emotionality was split into Emotionality: Attachment (EA), which combined the dependence and sentimentality facets and Emotionality: Worry (EW), which combined

the fearfulness and anxiety facets. For the EA component, the results showed that children's happiness showed a positive relationship between EA and monitoring, and EA and support. This suggests that high levels of attachment to offspring may predispose parents to increase the range of important caregiving behaviours, such as monitoring and support, due to higher levels of empathy for offspring. However, it is interesting that only cues of happiness, as opposed to the other facial cues, moderated parent monitoring and support for the Emotionality and EA. If low happiness is indicative of children's physical and mental health, one may question why cues of low health did not also function as a significant moderator. Health was not a significant moderator between EA and parenting behaviours probably because health may be a stronger predictor of survival compared to happiness. Thus, low health in children may be less motivating for parental investment. Put differently, children with low happiness may have higher chances of survival compared to children with low cues of health and thus investment in less happy children may be relatively less risky (for increasing parent fitness), even for parents high on Emotionality, as parents have higher chances of increasing the survival of children low in happiness compared to children low in health.

What is most interesting is that in contrast to the above findings, the interaction between EW and health showed a negative relationship with parent support. This is interesting because a) there were no main effects between EW, health, and parent support, b) the direction of this moderation was opposite to the moderations with Emotionality and EA as the predictor and c) this interaction significantly interacted with health, as opposed to happiness. Therefore, EW may be showing a cross-over interaction (Baron & Kenny, 1986). This means that parent support is not affected by EW or

children's health. However, if in a park you have parents high on EW and children high on health, parents may increase their level of support. This interaction also suggests that health may be an important cue for parental investment decisions for parents high in EW, because health may be a more direct predictor of offspring survival as cues of poor health were historically associated with infanticides and infant abandonment (Hrdy, 1999). A closer look at the factor loadings of EA and EW in the present study helps to understand the different parenting motivations in these two components of Emotionality.

A post-hoc principal components analysis showed that few items from EW loaded into EA and vice-versa in the present study. More specifically for EW, EA items such as, "I can't handle difficult situations without needing emotional support from anyone else" and "I feel like crying when I see other people crying" showed small to large negative loadings (r = -.23 and r = -.55, respectively) into the EW component. This suggests that high EW parents in the present may have also had low levels of EA component and thus, may have less empathy toward their children, compared to the general EA group. Since high levels of EW may already be associated with high concerns regarding offspring survival, the inclusion of low empathy may predispose these parents to invest more in the healthiest offspring and less in the less healthy offspring, as an adaptation to mitigate worries of kin survival. From an evolutionary perspective, it may be beneficial for parents high on EW, who may be exhausting mental and physical energy from excessive worry about offspring survival, to invest in healthy offspring, as investment in less healthy offspring may further deplete energy from worrying about the offspring's survival that could be conserved for other vital functions. Moreover, the low levels of empathy

associated with the EW trait in this sample may be making parents less motivated to invest in less healthy offspring.

Therefore, high levels of EA and EW may be differently linked with parent behaviours, specifically for parent support, and this may be dependent on children's happiness and health. The EA component of Emotionality may be driving the overall effects on parenting behaviours seen in the overall Emotionality factor. Collectively, EA and EW may off-set each other in the overall Emotionality trait as the lower levels of empathy in EW may be compensated with the high levels of empathy in EA, resulting in positive parenting behaviours for the overall Emotionality trait. This may have also been a reason for the null zero-order correlations between Emotionality and parenting behaviours in the present study. However, despite the conflicting characteristics of EA and EW, they may both be equally important in their associations with kin-relationships.

Limitations and Future Directions for Research

In addition to the previously mentioned limitations, it is important to be cautious of interpreting the overall findings of this study into real world speculations due to the following additional limitations.

Sample: The sample in the present study consisted of primarily White and middle class parents who were recruited form three local parks in St. Catharines. Therefore, the results may be less applicable to parents of different ethnicities and SES levels. In addition, this study had a relatively small size which may have limited chances of finding significant relationships between Emotionality, cuteness, and parenting behaviours. Further, the small sample size made it problematic to control for all possible confounding

variables (Hackshaw, 2008) such as children's birth order, children's activity level, and parents' exposure to other children, and thus only four covariates were added into the moderation analyses to ensure adequate cases for each independent variable (Fields, 2013). Future studies should replicate this study in a larger sample with a wider range in parents' ethnicities.

Self-reports: In the present study, parent personality was measured using self-reports which may have influenced a social desirability bias, especially for the Honesty-Humility factor (Ashton, Lee & de Vries, 2014), and thus could have benefitted from the addition of observer reports of parent personality, in which parents' personality could have been completed by a close family member or friend. In addition, this study may have benefited from parents' perceptions of their children's facial cues as parents' perceptions may be most influential in understanding parent behaviours rather than objective ratings of children's cues.

Risk of Type I Error: Conducting several moderation analyses (various combinations of three personality traits, four facial cues, and four parenting behaviours) may have increased the risk of a statistical type I error, in which false positive results may have been found in the present study. Future studies may consider alternate statistical analyses, such as Structural Equation Modeling, in order to examine multiple independent and dependent variables by minimizing the number of analyses conducted.

Strong correlations within the independent and dependent variables: The four parenting behaviours in the present study showed moderate to large relationships with each other. Also, three of the facial cues (cuteness, health, and happiness) showed large

correlations with each other, consistent with previous findings (Volk & Quinsey, 2002). Although the independent and dependent variables were not included in the same analyses, respectively, the different combinations of significant results found regarding the effects of facial cues on specific parenting behaviours in each of the significant moderation analyses should be interpreted cautiously. It is possible that due to less distinctions between the dependent and independent variables, the effects of certain facial cues and parenting behaviours may not be as definite as suggested. Future studies should replicate this study in order to reliability suggest that certain facial cues in children are associated with specific parenting behaviours.

Limited variation in parenting measures: The parenting measures used in the present study may be less generalizable to overall parent-child relationships, as the park environment of the present study could have been forcing a behaviour that was minimizing the range of parenting behaviours. For example, parents at a park may monitor their children more than parents at home due to relatively higher safety concerns at a park. In addition, parents at a park may also be less likely to communicate with or show affection toward their children due to children's high activity levels at a park compared to at home. Therefore, future studies should aim to investigate the influence of children's facial cues on parenting behaviours in other environments such as indoor-play areas and shopping malls.

Low internal consistency reliability for Honesty-Humility: The main and direct effect results related to Honesty-Humility should also be interpreted cautiously as the Honesty-Humility factor showed poor internal consistency reliability ($\alpha = .44$) in the present study. Although Ashton et al., (2014) suggested that Honesty-Humility generally

shows lower internal consistency reliability compared to the other factors of the HEXACO due to higher social desirability risks, the Cronbach's alpha found in the present study was lower than acceptable limits (George & Mallery, 2003). Additionally, a post-hoc principal components analysis revealed low loadings of items within the Honesty-Humility factor, such as "I wouldn't use flattery to get a raise or promotion at work, even if I thought it would succeed" (r = .03) and "I'd be tempted to use counterfeit money, if I were sure I could get away with it" (r = .06). These results suggest that participants may have been subjected to a social desirability bias, despite the use of deception. Therefore, it may be reasonable to conclude that the deception used in the present study may not have been successful and could explain why stronger results were not found between parents' personality, children's facial cues, and parent behaviours. As Honesty-Humility is not theoretically linked with parenting behaviours, future studies should further examine this trait to determine its degree (or lack) of relationship to parenting behaviours.

Lack of main effects and small effect sizes: In addition to the limitations previously addressed for the lack of main effects for each facial cue parenting behaviours, other reasons for the null findings could be that children's facial cues may account for a small variance for parenting behaviours. In addition, children's facial cues may not have been measured accurately in the present study. For example, the photographs of children's faces where captured when children were tired, wet, and dirty from playing at the park and splash pad which may have skewed their facial cue ratings. Finally, the effects of children's facial cues on parent behaviours may be over-powered by other factors such as children's behaviour and number of siblings at the park who may have

also played a role in supervising the children. Although there are many theories regarding the influence of children's facial cues on parenting behaviours, there is less empirical evidence regarding how these theories present in practical studies. Therefore, further studies should aim to investigate the influence of children's facial cues in mothers, fathers, and various environmental contexts with children of various age groups. Finally, the small effects found between Honesty- Humility and affection, and happiness and monitoring, in the present study are shown to be common when predicting a multiply-determined constructs, such as parenting (Prinzie et al., 2009).

Conclusion

The significant interactions found between parent personality and children's facial cues on parenting behaviours depict that both parents' and children's characteristics significantly influence parenting. Since evolutionary theories suggest that personality traits have evolved in order to adapt to environmental factors (Goldberg, 1981), the present study suggests that specific combinations of parents' personality traits and children's facial cues may positively or negatively impact parenting behaviours due to the costs and benefits of each personality factor of the HEXACO. This is supported by previous studies which have found that low empathy in parents may be associated with child abuse (Rosenstein, 1995) and that rejecting parental behaviours may be associated with behavioural and emotional problems in children (Patterson, 2002). In addition, previous studies have found that low levels of children's happiness may elicit negative emotions in adults (Frodi et al., 1978). The findings from this study also suggest that the combination of extremely low Emotionality in parents and happiness in children may be increase the risk for parent neglect and maltreatment. Therefore, understanding the bi-

directionally relationship of parenting and its implications on everyday parenting behaviours is important to enhance our understanding of parenting, parent-child relationships, and child development.

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Appendix A: Parent Demographics

1. Are you the child's mother or father? _____
2. How old is your child (in years)? _____
3. Is your child a boy or a girl? _____
4. What is your relationship to your child? (Please circle one):

   Biological child, Step-child, Adopted-child

5. What is birth order of the child (e.g., first born, second born, etc.)?_____
6. Please circle your approximate age in years:

   Less than 20, 21-30, 31-40, 41-50, 51-60, 61+

7. Please circle your marital Status:

   Married, In a relationship, Divorced, Single

8. How many children do you have (please list age for each child in years)?
   a. _____ boys
   b. _____ girls
9. What is your ethnic/racial background? (Check one of the following)
   a. White: _____
   b. Black: _____
   c. Asian: _____
   d. Aboriginal: _____
   e. Hispanic: _____
   f. Other: _____

10. Compared to the average Canadian, do you think your family is (circle one):

    a lot less wealthy, less wealthy, about the same, more wealthy, a lot more wealthy

11. For how many years have you been a parent? _____

12. On average, how many hours a day do you spend with your child? _____

13. On average, how many hours a day do you spend with other children (e.g., nieces, nephews, children at work, etc.) _____

14. Did you ever have a job that required direct contact with children? Yes___ No___

15. If yes, what was the title of your job? _____

16. On average, how often have you cared for other children such as younger siblings, cousins, nieces/nephew, etc.? (Please circle one):

    never, once per year, once per month, once per week, daily

Appendix B: HEXACO Personality Inventory – Revised

1 = strongly disagree 2 = disagree 3 = neutral 4 = agree 5 = strongly agree

1 _____ I would be quite bored by a visit to an art gallery.

2 _____ I plan ahead and organize things, to avoid scrambling at the last minute.

3 _____ I rarely hold a grudge, even against people who have badly wronged me.

4 _____ I feel reasonably satisfied with myself overall.

5 _____ I would feel afraid if I had to travel in bad weather conditions.

6 _____ I wouldn't use flattery to get a raise or promotion at work, even if I thought it would succeed.

7 _____ I'm interested in learning about the history and politics of other countries.

8 _____ I often push myself very hard when trying to achieve a goal.

9 _____ People sometimes tell me that I am too critical of others.

10 _____ I rarely express my opinions in group meetings.

11 _____ I sometimes can't help worrying about little things.

12 _____ If I knew that I could never get caught, I would be willing to steal a million dollars.

13 _____ I would enjoy creating a work of art, such as a novel, a song, or a painting.

14 _____ When working on something, I don't pay much attention to small details.

15 _____ People sometimes tell me that I'm too stubborn.

16 _____ I prefer jobs that involve active social interaction to those that involve working alone.

17 _____ When I suffer from a painful experience, I need someone to make me feel comfortable.

18 _____ Having a lot of money is not especially important to me.

19 _____ I think that paying attention to radical ideas is a waste of time.

20 _____ I make decisions based on the feeling of the moment rather than on careful thought.

21 _____ People think of me as someone who has a quick temper.

22 _____ On most days, I feel cheerful and optimistic.

23 _____ I feel like crying when I see other people crying.

24 _____ I think that I am entitled to more respect than the average person is.

25 _____ If I had the opportunity, I would like to attend a classical music concert.

26 _____ When working, I sometimes have difficulties due to being disorganized.

27 _____ My attitude toward people who have treated me badly is “forgive and forget”.

28 _____ I feel that I am an unpopular person.

29 _____ When it comes to physical danger, I am very fearful.

30 _____ If I want something from someone, I will laugh at that person's worst jokes.

31 _____ I've never really enjoyed looking through an encyclopedia.

32 _____ I do only the minimum amount of work needed to get by.

33 _____ I tend to be lenient in judging other people.

34 _____ In social situations, I'm usually the one who makes the first move.

35 _____ I worry a lot less than most people do.

36 _____ I would never accept a bribe, even if it were very large.

37 _____ People have often told me that I have a good imagination.

38 _____ I always try to be accurate in my work, even at the expense of time.

39 _____ I am usually quite flexible in my opinions when people disagree with me.

40 _____ The first thing that I always do in a new place is to make friends.

41 _____ I can handle difficult situations without needing emotional support from anyone else.

42 _____ I would get a lot of pleasure from owning expensive luxury goods.

43 _____ I like people who have unconventional views.

44 _____ I make a lot of mistakes because I don't think before I act.

45 _____ Most people tend to get angry more quickly than I do.

46 _____ Most people are more upbeat and dynamic than I generally am.

47 _____ I feel strong emotions when someone close to me is going away for a long time.

48 _____ I want people to know that I am an important person of high status.

49 _____ I don't think of myself as the artistic or creative type.

50 _____ People often call me a perfectionist.

51 _____ Even when people make a lot of mistakes, I rarely say anything negative.

52 _____ I sometimes feel that I am a worthless person.

53 _____ Even in an emergency I wouldn't feel like panicking.

54 _____ I wouldn't pretend to like someone just to get that person to do favors for me.

55 _____ I find it boring to discuss philosophy.

56 _____ I prefer to do whatever comes to mind, rather than stick to a plan.

57 _____ When people tell me that I'm wrong, my first reaction is to argue with them.

58 _____ When I'm in a group of people, I'm often the one who speaks on behalf of the group.

59 _____ I remain unemotional even in situations where most people get very sentimental.

60 _____ I'd be tempted to use counterfeit money, if I were sure I could get away with it.

Appendix C: Parenting Observations Form

Participant ID:

Child ID:

Research Assistant:

Observation 1 at 10 minutes- (<u>3 minute duration</u>, *use stop watch #1***)**

I. Parent monitoring: **Duration** of parent looking at the child (*use stop watch #2*)

a. _____ seconds
b. _____ seconds
c. _____ seconds
d. _____ seconds
e. _____ seconds
f. _____ seconds

Parent looked at the child for a total of _____ seconds [*a+ b+ c+ d+ e+ f*]

II. Parent communication: **Number** of sentences parent spoke with the child

Parental communicated with the child with a total of _____ sentences

III. Parent affection: **Number** of affection behaviour by parent with the child
   a. Parent gave a total of _____ hugs to the child
   b. Parent gave a total of _____ kisses to the child
   c. Parent gave a total of _____ smiles to the child
   d. Parent gave a total of _____ ( ) to the child
   e. Parent gave a total of _____ ( ) to the child

IV. Parent support: **Number** of assistance behaviours by the parent with the child (physical and/or verbal)
   a. Parent assisted child to climb _____ number of times
   b. Parent assisted child to make a friend _____ number of times
   c. Parent assisted child to ( ) _____ number of times

d. Parent assisted child to ( ) _____ number of times
e. Parent assisted child to ( ) _____ number of times

Observation 2 at 20 minutes- (<u>3 minute duration</u>, *use stop watch #1***)**

V. Parent monitoring: **Duration** of parent looking at the child (*use stop watch #2*)

g. _____ seconds
h. _____ seconds
i. _____ seconds
j. _____ seconds
k. _____ seconds
l. _____ seconds

Parent looked at the child for a total of _____ seconds [g+ *h*+ *i*+ *j*+ *k*+ *l*]

VI. Parent communication: **Number** of sentences parent spoke with the child

Parent communicated with the child with a total of _____ sentences

VII. Parent affection: **Number** of affection behaviour by parent with the child
f. Parent gave a total of _____ hugs to the child
g. Parent gave a total of _____ kisses to the child
h. Parent gave a total of _____ smiles to the child
i. Parent gave a total of _____ ( ) to the child
j. Parent gave a total of _____ ( ) to the child

VIII. Parent support: **Number** of assistance behaviours by the parent with the child (physical and/or verbal)
f. Parent assisted child to climb _____ number of times
g. Parent assisted child to make a friend _____ number of times
h. Parent assisted child to ( ) _____ number of times
i. Parent assisted child to ( ) _____ number of times

j. Parent assisted child to ( ) _____ number of times

Observation 3 at 30 minutes- (<u>3 minute duration</u>, *use stop watch #1***)**

IX. Parent monitoring: **Duration** of parent looking at the child (*use stop watch #2*)

m. _____ seconds
n. _____ seconds
o. _____ seconds
p. _____ seconds
q. _____ seconds
r. _____ seconds

Parent looked at the child for a total of _____ seconds [$m+ n+ o+ p+ q+ r$]

X. Parent communication: **Number** of sentences parent spoke with the child

Parent communicated with the child with a total of _____ sentences

XI. Parent affection: **Number** of affection behaviour by parent with the child

k. Parent gave a total of _____ hugs to the child
l. Parent gave a total of _____ kisses to the child
m. Parent gave a total of _____ smiles to the child
n. Parent gave a total of _____ ( ) to the child
o. Parent gave a total of _____ ( ) to the child

XII. Parent support: **Number** of assistance behaviours by the parent with the child (physical and/or verbal)

k. Parent assisted child to climb _____ number of times
l. Parent assisted child to make a friend _____ number of times
m. Parent assisted child to ( ) _____ number of times
n. Parent assisted child to ( ) _____ number of times
o. Parent assisted child to ( ) _____ number of times

	1 Very Weak	2 Weak	3 Moderate	4 Strong	5 Very Strong
Overall parental monitoring					
Overall parental communication					
Overall parental affection					
Overall parental support					

	1 Very Weak	2 Weak	3 Moderate	4 Strong	5 Very Strong
Child's overall level of activity					
Child's overall level of independence					
Child's overall level of sociability					
Child's overall level of happiness					

Opportunistic Observations

Serious:

Moderate:

Mild:

Overall Comments:

Appendix D: Rater Demographics

1. Please indicate your gender
    - Female
    - Male
    - Other
2. Please indicate your age in years
    - Less than 18
    - 18 – 28
    - 29 – 39
    - 40 – 49
    - 50 – 59
    - 60 +
3. Please indicate your marital status
    - Married
    - In a relationship
    - Divorced
    - Single
4. Please indicate your ethnic/racial background
    - White
    - Black
    - Asian
    - Aboriginal
    - Hispanic
    - Other

5. Compared to the average Canadian, do you think your family is
    - a lot less wealthy
    - less wealthy
    - about the same
    - more wealthy
    - a lot more wealthy
6. For how many years have you been a parent
    - 0
    - 1 – 5
    - 6 – 10
    - 11 – 15
    - 16 – 20
    - 20 +

Appendix E: Facial Cue Rating Scale

Please rate child's face for cuteness

1 (Extremely Low)	2	3	4 (Average)	5	6	7 (Extremely High)
○	○	○	○	○	○	○

Please rate child's face for cuteness

1 (Extremely Low)	2	3	4 (Average)	5	6	7 (Extremely High)
○	○	○	○	○	○	○

Please rate child's face for resemblance to adult

1 (Extremely Low)	2	3	4 (Average)	5	6	7 (Extremely High)
○	○	○	○	○	○	○

Please rate child's face for happiness

- 1 (Extremely Low)
- 2
- 3 (Average)
- 4
- 5 (Extremely High)

Appendix F: Ethics Clearance Certificate

Brock University
Research Ethics Office
Tel: 905-688-5550 ext. 3035
Email: reb@brocku.ca

Social Science Research Ethics Board

Certificate of Ethics Clearance for Human Participant Research

DATE: January 21, 2016

PRINCIPAL INVESTIGATOR: VOLK, Tony - Child and Youth Studies

FILE: 14-186 - VOLK

TYPE: Undergraduate STUDENT: Prarthana Franklin
SUPERVISOR: Tony Volk

TITLE: Child Facial Cues and Parental Interactions

ETHICS CLEARANCE GRANTED

Type of Clearance: MODIFICATION Expiry Date: 3/31/2016

The Brock University Social Sciences Research Ethics Board has reviewed the above named research proposal and considers the procedures, as described by the applicant, to conform to the University's ethical standards and the Tri-Council Policy Statement.

Modification: Change to location/use of laptop.

The Tri-Council Policy Statement requires that ongoing research be monitored by, at a minimum, an annual report. Should your project extend beyond the expiry date, you are required to submit a Renewal form before **3/31/2016**. Continued clearance is contingent on timely submission of reports.

To comply with the Tri-Council Policy Statement, you must also submit a final report upon completion of your project. All report forms can be found on the Research Ethics web page at http://www.brocku.ca/research/policies-and-forms/research-forms.

In addition, throughout your research, you must report promptly to the REB:

a) Changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
b) All adverse and/or unanticipated experiences or events that may have real or potential unfavourable implications for participants;
c) New information that may adversely affect the safety of the participants or the conduct of the study;
d) Any changes in your source of funding or new funding to a previously unfunded project.

We wish you success with your research.

Appendix G: Parent Consent form 1

Project Title: Children's Facial Cues

Principal Investigator (PI): Dr. Tony Volk, Associate Professor

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Student Principal Investigator (SPI): Prarthana Franklin, M.A. Candidate

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Brock University

INVITATION

You and your child are invited to participate in a study. Your child has to be between 3 and 6 years in order for both you and your child to participate. The study involves examining how children's facial cues influence the way children play with each other. Previous laboratory research has shown that children's facial cues can influence people's perceptions, but very little work has been done in real-world settings.

WHAT'S INVOVLED

As a participant, you will be asked to fill out some questionnaires on your demographics (which will be used for descriptive purposes) and personality traits, which will take approximately 5 minutes. We also need to obtain good quality digital images of you and your child's faces for future participants to view in a slide show and then provide us their

impressions of certain facial features (e.g., health, cuteness). We would like to emphasize that we wish to observe natural behaviors of you and the child. We will make 3 separate 3-minute observations over the period of the 30 minutes, so your child will not be under constant surveillance. Participation in this study will take approximately 35 minutes of your time in total.

CONFIDENTIALITY

All information gathered from these studies will be kept completely confidential and the personal information of you and your child will in no way be compromised. The pictures you provide will not be made publically available or posted on the Internet, nor will they be linked with any identifiable personal information. You will be assigned a number code, which will be recoded on your photograph and questionnaires and will be used to connect your photograph and questionnaires. The images will be securely stored on password-protected computers and the questionnaires will be stored in secured and locked cabinet in Dr. Volk's lab and will not be used for any other purpose beyond the second part of the study. All the data will be destroyed after 5 years following the publication of the results. Data obtained on paper (questionnaires) will be shredded using a shredding machine and all photographs will be permanently deleted off the software and hardware of the Volk Lab Computer (photographs will be permanently deleted from the Digital Camera as soon as they are transferred to the Volk Lab Computer at the end of the data collection process).

COMPENSATION

As a volunteer, you will be provided with $10 as compensation for your participation in this study. You will still receive the $10 compensation if you choose to withdraw from the study.

POTENTIAL BENEFITS AND RISKS

Possible benefits of participation include learning more about how children faces influence behaviors. In addition, this research should provide valid, naturalistic, observational data that is necessary to supplement the growing body of experimental research data on the influence of infant and child facial cues. There are no known or anticipated risks associated with participation in this study except for any distress that may be caused from completing the questionnaire regarding parental stress. If any of the questionnaires cause emotional distress, contact information for the Niagara Counselling Services is provided in the debriefing form.

VOLUNTARY PARTICIPATION

Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study and you are free to withdraw yourself and your child from these studies at any time. If you do so prior to the completion of the observations, there will be no penalty for leaving the study.

PUBLICATION OF RESULTS

Results of this study may be published in professional journals and presented at conferences. The results of this study will be available on the Volk Developmental Lab webpage www.brocku.ca/volklab within one year (March 2016).

This study, and its methods, have been reviewed and received ethics clearance through the Research Ethics Board at the Brock University (14-186-Volk). Should you have any questions at any time, you may Dr. Anthony Volk at (905) 688-5550 ext. 5368 (tvolk@brocku.ca), or the Brock University Research Ethics Board at (905) 688-5550 ext. 3035 (reb@brocku.ca). Please keep a copy of this letter for your own records.

Children's Facial Cues Parent Letter of Consent

I hereby give permission for myself and my child to participate in this study of child facial cues. I understand that it involves both observing my child and as well as taking photographs of us that are to be used in a follow-up study. I have read the accompanying letter of information and have had any questions answered to my satisfaction. I have been assured that the data gathered from this study, and the identity of any photos provided will be kept in strict confidentiality.

Signature:

Date:

Appendix H- Informed Assent

Script:

"Hi _____ (child's name). My name is _____ (researcher's name). Would it be ok if I watched you play and take your picture? Your mom/dad has said it's OK.

Child has provided verbal assent. Yes _____ No _____

Date: _____

Appendix I: Parent Debriefing Form

Thank you for participating in this study of children's facial cues.

We initially stated that the focus of this study was examining how children's facial cues influence the way children play with each other. Although this was one of the goals on the study, other goals of this study were to examine whether or not parental behaviours are influenced by parental personality traits and their children's facial cues. For example, parent-child resemblance may influence how often the parent and child communicate with each other. As this is relatively new research, we are currently unaware of exactly how child facial cues will influence parents, but laboratory research suggests that cues of good resemblance, cuteness, and health will all positively influence parental behaviour. We also expect that parental personality traits further influence this relationship. It was essential that we did not initially disclose that the study was observing parenting behaviours as this information could bias the way parents naturally interact with their children. We would like to emphasize that parental behaviours are not judged or rated, but simply observed and recorded.

Parenting is a complex job, and there are a variety of healthy ways to perceive and respond to children. Further, we expect that facial cues and parental personality traits are only part of a large number of factors that influence parenting. If you wish to learn more about the area of the influence of facial cues on parental care, you can visit Dr. Volk's lab web site at: www.brocku.ca/volklab . When we have finished analyzing the results of the current study, the overall results will also be posted on that web site.

Should you have any further questions or concerns, you may freely contact Dr. Anthony Volk at (905) 688-5550 ext. 5368 (tvolk@brocku.ca), or the Brock University Research Ethics Board at (905) 688-5550 ext. 3035 (reb@brocku.ca).

If you would like to discuss parenting and related topics with someone, we suggest contacting Niagara Counseling Services at (905) 988-5748 or the Canadian Mental Health Association at 1-800-668-6868.

Appendix J: Parent Consent Form 2

Project Title: Children's Facial Cues

Principal Investigator (PI): Dr. Tony Volk, Associate Professor

Student Principal Investigator (SPI): Prarthana Franklin, MA Candidate

Department of Child and Youth Studies

Brock University

After being debriefed about the entire study and the reasons for the initial incomplete disclosure of the goals of the study, I hereby give permission myself and my child to participate in this study of child facial cues. I understand that it involves both observing my child and as well as taking photographs of us that are to be used in a follow-up study. I have read the accompanying letter of information, received a ten dollar incentive for my participation, and have had any questions answered to my satisfaction. I have been assured that the data gathered from this study, and the identity of any photos provided will be kept in strict confidentiality.

Should you have any questions at any time, you may contact Dr. Anthony Volk at (905) 688-5550 ext. 5368 (tvolk@brocku.ca), or the Brock University Research Ethics Board at (905) 688-5550 ext. 3035 (reb@brocku.ca). Please keep a copy of this letter for your own records. As a volunteer, I am free to withdraw from the study at any time.

Signature:

Date:

Appendix K: Poster

We are looking for participants to participate in a study called Child Facial Cues

The study involves coming to a Brock University lab, viewing a series of child and adult faces in a slide show, and rating those faces for cuteness, health, happiness, and resemblance to adult. A brief questionnaire is also given. **The study takes approximately 20-30 minutes to complete, and we will provide $10 in compensation for participation.** Participants must be 18 years or older. For further information, please contact Prarthana Franklin via email ≤ pf13sl@brocku.ca > or telephone < 416-788-4271 > if interested. This study is conducted by the Primary Investigator, Dr. Tony Volk, Department of Child and Youth Studies, and has been reviewed and received clearance from the Brock University Research Ethics Boards (14-186-Volk)

pf13sl@brocku.ca	pf13sl@brocku.ca	pf13sl@brocku.ca	pf13sl@brocku.ca	pf13sl@brocku.ca	pf13sl@brocku.ca	pf13sl@brocku.ca	pf13sl@brocku.ca	pf13sl@brocku.ca	pf13sl@brocku.ca	pf13sl@brocku.ca

Appendix L: Rater Consent Form

Project Title: Children's Facial Cues Parental Interactions

Principal Investigator (PI):

Dr. Tony Volk, Associate Professor

Department of Child and Youth Studies

Brock University

Tel (905) 688-5550, ext. 5368

tvolk@brocku.ca

Student Principal Investigator (SPI):

Prarthana Franklin, MA Candidate

Department of Child and Youth Studies

Brock University

INVITATION

You are invited to participate in a research study. You have to be 18 years or older in order to participate in this study.

WHAT'S INVOVLVED

As a participant, you will be asked to look at and rate a series of child faces for cuteness, health, happiness, and resemblance to adult faces. You will view approximately 50 child faces in a computer slide show, and record their ratings of those faces on the computer. The purpose of this study is to examine how adults perceive and respond to infant and child facial cues. Participation in this study will take approximately 45 minutes of your time in total.

CONFIDENTIALITY

All information gathered from this study will be kept completely confidential and your identity will in no way be compromised. You will be assigned a number code, which will be connected your completed questionnaires. Data from this study will only be accessible by Dr. Volk and his research assistants, and it will be stored in a secure cabinet and computer for a period of 5 years (after which it will be shredded/deleted). All data will be destroyed five years after publication of results. The results of this study are intended to be published in peer-reviewed scientific journals. You may choose to withdraw from the study at any time as long as you are still at location of the study. If you choose to withdraw from the study before or after completion, all of the information which you have provided will be shredded immediately as there will only be one participant completing the study per session at all times.

COMPENSATION

As a volunteer, you will be provided with $10 cash as compensation for participating in this study. You will still receive the compensation if you choose to withdraw from the study.

POTENTIAL BENEFITS AND RISKS

There are no benefits for participants. However, this research should provide valid, naturalistic, observational data that is badly needed to supplement the growing body of experimental research data on the influence of infant and child facial cues on adult behavior. There are no known or anticipated risks associated with participation in this study.

VOLUNTARY PARTICIPATION

Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study and you are free to withdraw yourself from these studies at any time. If you do so prior to or after the completion of the study, all of the information which you provide will be shredded immediately and you will still receive the $10 compensation. There will be no penalty for leaving the study.

PUBLICATION OF RESULTS

Results of this study may be published in professional journals and presented at conferences. The results of this study will be available on the Volk Developmental Lab webpage www.brocku.ca/volklab within one year (March 2016).

This study, and its methods, to have been reviewed and received ethics clearance through the Research Ethics Board at the Brock University (14-186-VOLK). Should you have any questions at any time, you may Dr. Anthony Volk at (905) 688-5550 ext. 5368 (tvolk@brocku.ca), or the Brock University Research Ethics Board at (905) 688-5550 ext. 3035 (reb@brocku.ca). Please keep a copy of this letter for your own records.

Appendix M: Rater Debriefing Form

Thank you for participating in this study of children's facial cues.

If you wish to learn more about the area of the influence of facial cues on parental care and adult behaviour, you can visit Dr. Volk's lab web site at: www.brocku.ca/volklab . When we have finished analyzing the results of the current study, the overall results will also be posted on that web site.

Should you have any further questions or concerns, you may freely contact Dr. Anthony Volk at (905) 688-5550 ext. 5368 (tvolk@brocku.ca), or the Brock University Research Ethics Board at (905) 688-5550 ext. 3035 (reb@brocku.ca).

If you would like to discuss parenting and related topics with someone, we suggest contacting Niagara Counselling Services at (905) 988-5748 or the Canadian Mental Health Association at 1-800-668-6868.